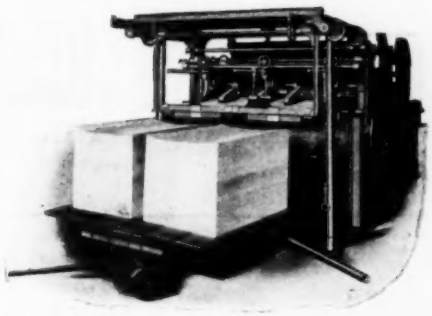
Don't flinch, don't foul,
Hit the line hard.
—THEODORE ROOSEVELT



"Hit the line---hard!"

A formidable fact "formation"

There are seven live facts in the Lay Boy "line."

These seven facts are hard-hitting fellows—assertive against the opposing line of many undiminished costs.

The two Ends are
"Increased Output."
"Paper Piled straighter."

The two Tackles are
"Fit any make of Cutter."
"Operate Automatically."

The two Guards are
"Utilization of present trucks."
"Makes wide cutters desirable."

The Center is the husky lad,
"LABOR SAVING"

IS not one effective way to combat today's problems to "hit" them just as two splendid football teams meet in vigorous battle?

As one man puts it, grab a nettle lightly and it stings you, but grasp it firmly and you feel no injury.

M & W Lay Boys are good players in the game of business—they "line up" perfectly and help you to "hit the line hard"—and effectively.

On receiving a letter from you, we will be glad to do either one of two things—(1) submit prices—(2) send the Lay Boy on thirty days' trial.

Signals!

The Moore & White Company

ESTABLISHED 1886

No. Phila. Sta., P. R. R., PHILADELPHIA, PA.

Vol. 3—No. 8

THE PAPER INDUSTRY

A. SCOTT DOWD
Editor

A MONTHLY EDUCATIONAL JOURNAL
Devoted to the Interests of the Pulp and Paper Industry

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Yesterday, Today and Tomorrow

TIME moves rapidly. The seasons come and go often before we can barely realize they are upon us. Conditions, too, change as rapidly as the seasons. It was only yesterday that every jobber, broker, and user of paper was chasing up and down the highways and byways, from mill to mill, begging and coaxing for a few sheets of paper. The manufacturer sat in his office, with his former salesmen, unless he foolishly turned them loose, and smiled at the ravings of the man who wanted to buy his paper. And as he saw them coming and pleading to be supplied, he occasionally, and in many cases too often, boosted the price, just to break the monotony.

But, as is always true, conditions changed, as it were, over night, and today we find that the jobber, broker and the user are driving the team, and if we hear any loud noise that might sound like a smile, it is not the mill man that is doing it. If he discharged his former salesmen when things went easy, he has been compelled to get someone else, and if he did not, he has directed his salesmen to go out and get the orders, and it is not so important how they are secured, but the salesman is told to bring home the bacon, and this is often done with no profit to it, and in many cases orders are taken at a loss.

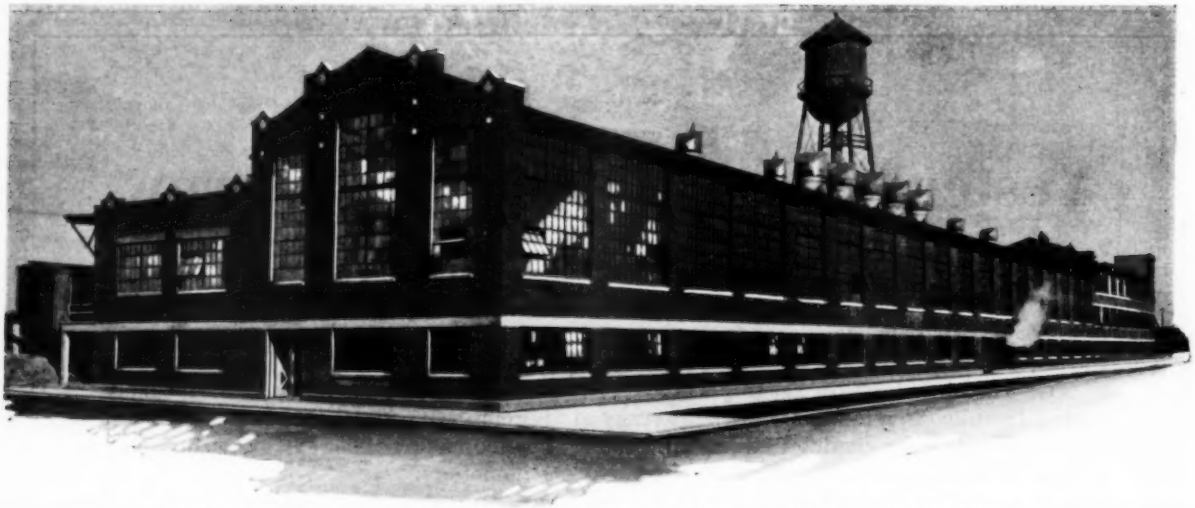
The pendulum has now swung the other way, but we all should be thankful that it has gone its limit, and has already started to come back again. None of us know how far it will go in the other direction tomorrow. Surely none of us want it to swing as far as it did the last time, nor do we want it to swing as far back as it did recently. The condition of yesterday may have been good for the manufacturer, but this is very doubtful. Certainly it was not good for any other element in this industry, and any condition that does not work for the good of all concerned, is not a good condition.

I have heard men, who have been important cogs in this industry for many years, say they never saw a condition equal to the one from which we are just emerging. And yet we have all survived. Most of us are healthy and fat, and possibly the drubbing we have been passing through will eventually be good for us.

But what are we doing to prevent a repetition of either the condition of yesterday or that of today? How are we facing the morrow?

There possibly never was a time in this country when paper was so badly needed as now. Every form of printed matter in the shape of books, booklets, catalogs, etc., has run low. Stocks of most of the merchants are much below normal, possibly waiting for hoped for further reductions, which may or may not come. Prominent men in many lines of industry tell us we are on the verge of a great feast in the shape of plenty of orders in all of the industries, including the best of all, that of making and selling paper.

Let us all hope and work for this condition to come about, but also let us all be patient, put our shoulders to the wheel and give a good, long, hard push, and then another one, but at the same time let us all hope and work that the condition of tomorrow will be unlike that of either today or yesterday.



CHILLICOTHE PAPER CO., CHILLICOTHE, OHIO—SIROCCO EQUIPPED
Built by The Austin Company, Cleveland, Ohio

In the plant of the Chillicothe Paper Company, through the application of warm air, water vapor is carried away and drying capacities have been measurably increased.

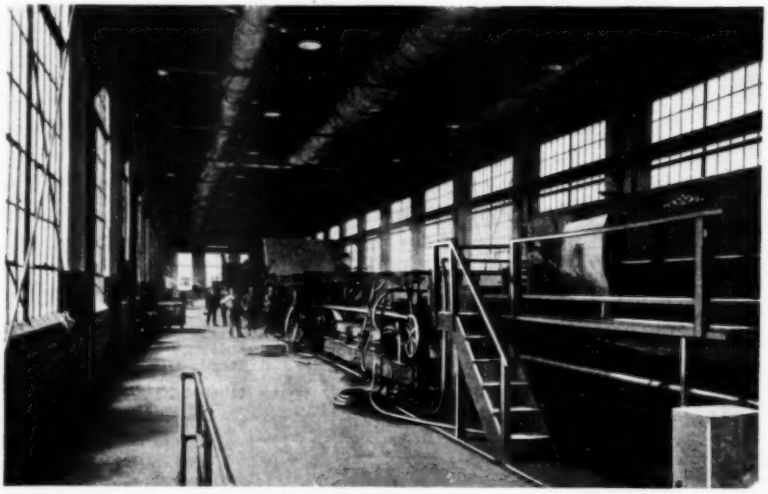
In the beater, Jordan and machine rooms, vapor removal is vital. Moisture must not be permitted to condense on ceilings, not only for manufacturing reasons, but in consideration of the life of the structure. Properly tempered air in the finishing rooms speeds up the drying of the coatings.

"Sirocco"
TRADE MARK

Thus all through the Chillicothe plant, Sirocco equipment carries off tons of moisture daily, speeding production and keeping the spirit of labor healthy and satisfied.

We have a booklet "A B C Equipment for Paper Mills" which covers the ventilating subject in detail. Do you care for a copy?

American Blower Company
DETROIT, MICHIGAN



The Machine Room of the Chillicothe Paper Co. is equipped with the "Sirocco" System of Heating and Ventilating to eliminate condensation on ceiling and walls.

Industrial Medical Service—A Profitable Investment

WE ARE living in an era when industrial managers appreciate the value of the individual man as an important factor in production.

For years managers of industrial enterprises, when seeking to increase the efficiency of their plants, have directed their efforts toward the improvement of mechanical equipment and processes. Money expended to perfect a machine which would turn out a larger quantity of the product or produce it at a lower cost was considered a highly profitable investment.

Progressive industrial managers today realize more keenly than ever before that men are fully as important to the success of industry as machines, and while they do not ignore the importance of mechanical improvement, they nevertheless are awake to the great possibilities of increasing production and cutting down overhead cost by conserving and developing the man power that is required to operate their plants.

For this reason managers of industrial concerns are now spending a great deal of money in establishing and maintaining high grade medical departments, and in doing so they know that they are making a profitable investment. They know that this expenditure will bring returns in reduction of time lost by employees on account of sickness and accidents; in reduction of compensation claims for accidents and occupational diseases; in higher output by employees who are able to produce more because the health supervision exercised by the medical department keeps them healthier and more energetic; in higher output by employees who are placed at work which is best suited to their physical abilities as determined by careful physical examination; in reduction of labor turnover brought about by elimination of health hazards and by supervision of sanitary conditions within the plant; and, finally, in the development of genuine plant spirit, through the activities of industrial physicians and nurses, who are constantly working to promote the best interests of the employees.

Such returns on an investment to conserve the human element in production are always obtained by a medical department which is organized with competent personnel and which conceives of its function as being not merely to render first aid or give emergency treatment, but primarily to prevent sickness and improve the health of the workers, so that they may be able to enjoy continuous productive employment and give their best to the job.

—R. T. Solensten.

The 1922 Foreman

MANY a fellow has looked forward to the time when he would get his boss' job and then after years of plugging when he finally landed in the swivel chair he didn't stick.

Why? Simply because he thought the company owed him a job when as a matter of fact he owed the company more than ever because of his increased responsibilities. He had sold to the management the idea that he was capable to handle the foreman's job but he forgot that to make good it would be necessary to sell himself over again from day to day.

Now that accidents in industry have been proven to be unnecessary, one of the best ways in which the foreman can repeatedly sell himself is to keep his accidents down to the minimum. The yearly profits that any one department in a plant makes can very easily be wiped out in one bad accident.

But the 1922 foreman, the foreman who is ahead of the parade, is not so much concerned about the cost of a serious accident as he is about the suffering that will come to his man as a consequence.

The bully, nagging foreman lived in a day that is past. The up-to-date foreman is respected by his men not only on account of his superior ability but also because he takes a personal interest that goes so far as to make his department a safe working place.

Show me a foreman with a low accident record and I'll show you a foreman who isn't worried about "labor unrest" and troubles of like nature.

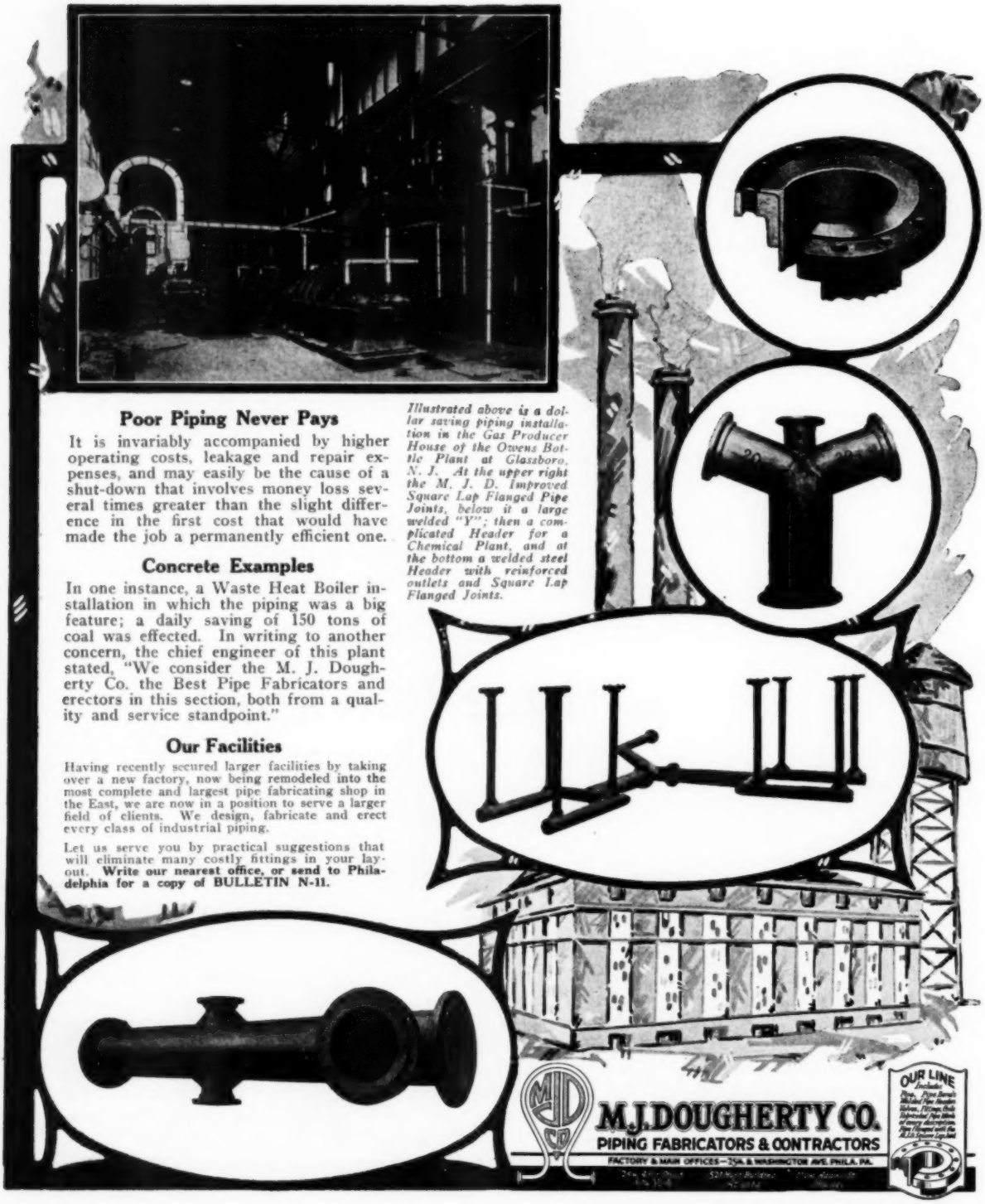
Look alive, Mr. Foreman. If you are having accidents I'll say you're headed for the pink slip and you'd better get on the safety wagon. Your manager knows that other foremen are making low accident records. After all why not get busy and cut 'em out in your department just for the sake of your men to whom you owe your job?

Let's see if you are in the 1922 rank.

—A Foreman for 13 Years.

When It Comes to Piping—Come to Dougherty

**From the Estimate to the Finished Job and in Operation Ever Afterwards—
We Can Show You Real Economy, Direct Savings
in Dollars and Cents**



Poor Piping Never Pays

It is invariably accompanied by higher operating costs, leakage and repair expenses, and may easily be the cause of a shut-down that involves money loss several times greater than the slight difference in the first cost that would have made the job a permanently efficient one.

Concrete Examples

In one instance, a Waste Heat Boiler installation in which the piping was a big feature; a daily saving of 150 tons of coal was effected. In writing to another concern, the chief engineer of this plant stated, "We consider the M. J. Dougherty Co. the Best Pipe Fabricators and erectors in this section, both from a quality and service standpoint."

Our Facilities

Having recently secured larger facilities by taking over a new factory, now being remodeled into the most complete and largest pipe fabricating shop in the East, we are now in a position to serve a larger field of clients. We design, fabricate and erect every class of industrial piping.

Let us serve you by practical suggestions that will eliminate many costly fittings in your layout. **Write our nearest office, or send to Philadelphia for a copy of BULLETIN N-11.**

Illustrated above is a dollar saving piping installation in the Gas Producer House of the Owens Bottle Plant at Glassboro, N. J. At the upper right the M. J. D. Improved Square Lap Flanged Pipe Joints, below it a large welded "Y"; then a complicated Header for a Chemical Plant, and at the bottom a welded steel Header with reinforced outlets and Square Lap Flanged Joints.

M. J. DOUGHERTY CO.
PIPING FABRICATORS & CONTRACTORS
FACTORY & MAIN OFFICES—25th & WASHINGTON AVE. PHILA. PA.

OUR LINE includes

A Sponge or a Light, Which?

A SPONGE and a light are diametrically opposite to each other. A sponge absorbs and takes in, but gives out nothing. A light gives out its rays and absorbs nothing. A sponge is worthless except as a mop, while a light sheds its rays of light and helpfulness to all mankind, and yet loses nothing in the giving.

It is just so with men, some of whom absorb and take in all they can get hold of, while others are constantly shedding new light, and lose nothing in the giving. One is a miser and the other a philanthropist. The first cannot be happy, for the reason that he does nothing to make others happier or wiser, while the second is happiest when he is doing good to others.

Up until a few years ago most men in this great industry seemed to be of the opinion that they had certain secret ways of doing things that others did not know about, and what little they did find out for themselves, they guarded closely, thinking they knew something no one else knew, not realizing that the other fellow was doing exactly the same thing. But conditions have been changing fast in this industry, and today most men are willing to give out the things they know, realizing that this is the only way they can expect to get in something that other men know.

For a year past, The Paper Industry has been offering prizes aggregating $1,000, divided up into certain sums, for the most helpful articles written during a year. These prizes will soon be awarded, and the men who have taken the time to prepare articles of helpfulness for their fellow men will receive the money. Many of them will possibly not receive amounts commensurate with the effort bestowed to furnish these articles, but they will have the added satisfaction that they have done something of helpfulness to their fellow men, and that they have also received something of helpfulness from others.

As soon as the decisions have been given out as to the lucky ones of the former contest, there will be another prize of $1,000 offered, divided up into various sums, possibly on the same basis as the last contest, to cover over the year 1922. A prize of $300 for one article is something worth striving for, but the great satisfaction of having done something that was really helpful to one's fellow man is worth infinitely more than the highest prize that could be received in money.

It is to be hoped, therefore, that the number of good articles received during 1922 will be many times the number received during the time of the last contest. Our aim is to secure something that will be helpful in this great industry, and we are ready and willing to spend our money so that others may be benefited. We are repaid in the knowledge that we are doing a real service. We have already been more than repaid for the first contest in the receipt of many letters of commendation, but in order to make such a contest of the greatest good to this industry we must have the co-operation of the whole industry.

Let every one, therefore, put this thinking cap in working order, and get ready to submit a real helpful article, something that will help someone else. They do not have to be long, nor do they need to be written to indicate great scholarly attainments, but we do want them to be helpful.

Be a light, and radiate something good.

The Sign of Efficiency

MORSE DRIVES

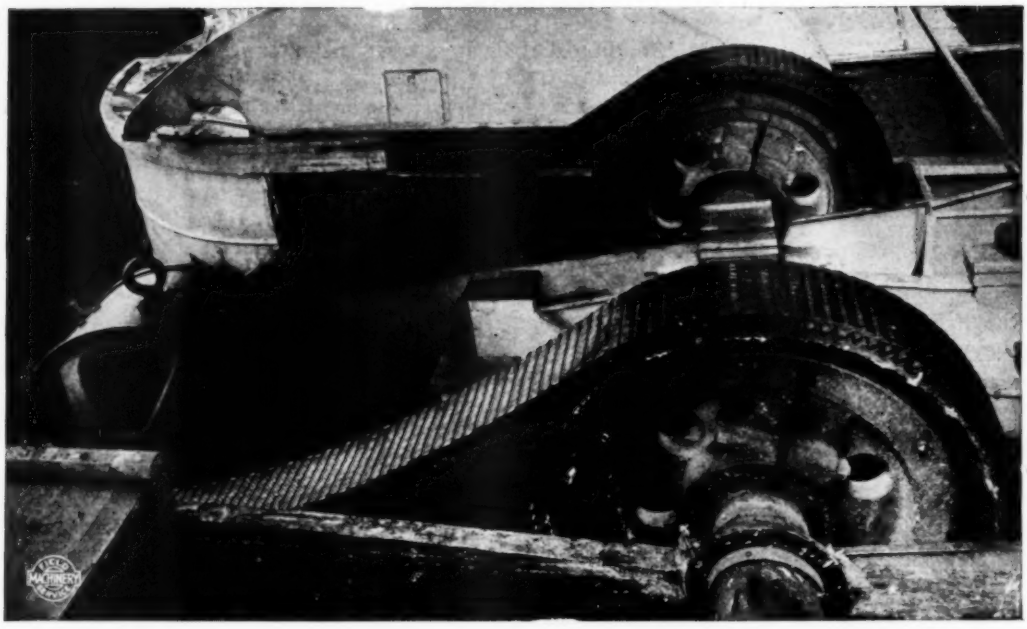
The Sign of Durability

Positive as Gears

THE MORSE "ROCKER JOINT"

Flexible as a Belt

Longer Life



Chains Used to Drive "Beaters" in a Paper Mill Work 24 Hours a Day, 6 Days Per Week

The Morse Chains shown are part of an installation in a large Eastern paper box factory, transmitting power from 150 H.P. Motors to the "beaters."

The driven sprockets in the illustration are of Shearing Pin construction. When the beater clogs the pins shear at a predetermined load and thus protect the beater, drive, bearings and motor. New pins are quickly and easily inserted and the drive started again.

Morse Chains are 99% efficient—silent, durable and economical to maintain. If your belts or gears are subjected to unusual conditions of wear and exposure or if you are losing production and increasing costs through belt slip, talk over the conditions with a Morse Engineer.

Our engineers are power transmission experts and will tell you frankly whether or not Morse Chain is the solution.

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"Morse" is the Guarantee Always Behind the Efficiency, Durability and Service

Business Sense

By IKE KENNEDY

Character

CHARACTER may be written either in men or materials. It is a thing which may take a lifetime in its building and may be destroyed in a single act, or fail through the slightest defect of a single piece of material. The surgeon who has spent a lifetime in developing, may destroy the character of his years of success in one slip of the knife.

Good character is not always what we are, but what we seem to be, what we hope to be, and what we want people to believe we are. The searching eye of our own conscience helps us to build and guard character against the ubiquitous force constantly influencing its destruction.

We came into this world without character, either good or bad. What we have taken from the world as we have passed through it, has depended largely upon environment, teaching, and upon our own susceptibility of righteous discernment.

The things we build reflect our character, for it is into such construction that we unconsciously build our character. The pictures of Raphael reflect the religious fervor of a Godlike character—yet the man endowed with this great gift, upon the surface, may have been utterly devoid of the spirit reflected in his work; and on the other hand, the roughest character may have hidden beneath its mask of roughness, all the gentleness and kindliness of a child.

The greatest heroes have sprung from the weakest of inspired cowards, and the posing bully is often cowed by the weakest of women.

Character, then, is exactly what good we make of evil, or what evil we make of good.

Are we drifting away from character in business? If we are, someone is going to get what's coming to him in a court of equity, whose tongue is long and swings in the middle; for a business character once besmirched cannot change location fast enough to regain lost prestige.

Today this nation has a good character. A character of which we are justly proud; a character which is doing credit to our progenitors, who left us as a birthright, a good name that must not be sullied through sharp practice or unmindfulness.

We are about to sit in conference with the heads of the nations of the world. They are coming to us in confidence, they belive in us, they trust us—they will continue to trust us because we are going to lead them only with a good name, that has never yet stooped to littleness and ever played the game open and above board, ever willing to lay the cards on the table.

But the chain is no stronger than its weakest link. Are we individually creating character that will keep this nation ever the haven of fairness, justice and righteousness.

Is it even possible that there will ever come a time that any ism can so far distract us that we will not sense its evil and crush it. We think not!

"It matters not which way we turn,
In after years when passions burn,
The things we think are but the things we do,
My life no more belongs to me than you."

We're Off

THIS would be a mighty monotonous old world if we always knew just what was going to happen. We wouldn't enjoy ourselves if we always stay **put.** We wouldn't enjoy ourselves if we were constantly shifted. We would become all-fired lazy and doles if we could work out our fate from a table of averages. We would all be victims of the prowess of the mathematician.

If we knew right now just what was going to happen in the next six months and could back it up with proof, our troubles would be over! If we had enough nerve to take a chance on what seems like a safe deduction from present prospects we would stand a mighty good chance of winning if we would put up the stakes and get in the game.

Business is ever more or less a game of chance, and as there is more or less of the gambling spirit in all of us, why wouldn't a pretty good safe bet and a game well worth getting into if we started something a little bigger than mere "penny-ante." We seem listless, our minds don't seem to be on the game, we are forever asking, "What's trumps?" "Whose lead?" "Where do we go from here?" and "When do we eat?"

We'll tell you what's trumps—**Hearts are trumps**—real, true, honest-to-goodness human hearts. We'll tell you whose lead it is—**It's your lead**; you with the big YOU,.and we can't play until you do lead. Where do we go from here? Why, we go right "over the hills to the poor house," if you will it that way, or we travel in state down the road of unprecedented prosperity if you want to go that way. **When do we eat?**—Well, that depends—how hungry you are—what are you willing to put into the pot, what effort will you give for a meal ticket?—that's what we want to know.

We're off—are you going to join us, or are you going to sit there nursing your bumps?

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Control of Causticizing Lime by Determining Active CaO Content

By G. K. SPENCE

IT IS a generally accepted fact that the value of a lime for causticizing purposes should be based on the active CaO content and not on the total CaO present.

In addition to the inactive CaO present as sulphate and carbonate, in many limes there is considerable CaO enclosed by over-burning and fusing so that the slacking water cannot reach it. This is more prevalent in the case of high silica limes.

The sulphate and soda pulp manufacturers should know when purchasing a car of lime, just how much of the CaO present is active when used in the mill. He should have a quick dependable method for determining this in order that the proper quantity of lime shall be used, and at the same time be in a position to make claims on all cars testing under the specified guarantee.

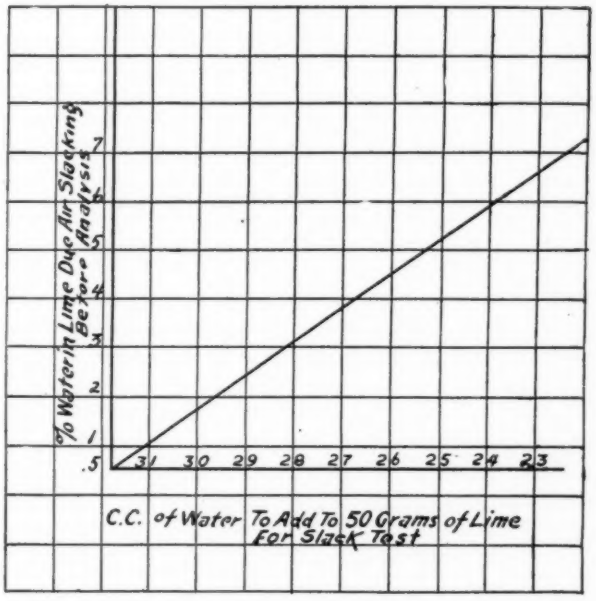
The causticizing method has been advanced and gives fair results with a high calcium, low silica, easy slacking lime; but the writer has found that in case of high silica limes, which will not slack readily, the method is not at all dependable, nor will results conform with those obtained in the mill. The writer has modified the causticizing method by first slacking the required amount of lime in twice its weight of water, and heating gently on the hot plate for about five minutes, after which the required amount of water and soda are added and boiled for one-half hour as specified in the causticizing test. This forces the slacking of the lime and gives higher results, but not enough higher to conform with results obtained in the mill. In the tabulation given below this modified causticizing method was used.

We have worked up a method in our laboratory, which has been in use for several years, and gives excellent results, checking actual mill conditions very closely. Knowing it to be of great value to those confronted with the problem of evaluating lime for causticizing purposes, the writer offers this method for their use.

We call the method the "Slacking Test," which is based upon the amount of water taken up by the active CaO in slacking.

In the first place great care should be exercised in sampling the lime in order to get an average sample of the car without which any test would not be representative.

We have found by carefully estimating the fines and lumps in cars of lime as received, that they contain about ¾ lumps and ¼ fines. We therefore take three bucketfulls of lumps by using a hammer and breaking pieces from lumps all through the car. We then clear a space near the doorway and shovel a bucketfull of fines from the floor of the car. This entire sample is taken to the floor of another empty car, or other suitable flat surface, broken up some with the hammer, mixed thoroughly and quartered in the usual way. About one-half bucket of this lime is then passed through a Sampson crusher and an air tight quart bottle sample taken to the laboratory for analysis. This sample, which contains lumps from the size of a pea to fine lime, is the right size for the "Slacking Test."



Before making the "Slacking Test" a portion of the lime is taken from the sample bottle and finely ground preparatory to making a carbonic acid test, and test for loss on ignition.

Loss on Ignition

One gram of finely ground lime is ignited in a platinum crucible for one-half hour and loss on ignition determined.

Carbonic Acid

If there is a combustion train set up and handy for a CO_2 determination, more dependable results can be obtained by its use; but if it is not set up and the operator is not familiar with its use, a Baker Carbonate Hydrometer or other acceptable quick CO_2 apparatus

can be used, and the error not be enough to cause any serious complications.

The percentage of carbonic acid found is subtracted from the total loss on ignition, and the balance represents the water present in the lime due to air slacking.

In order to hasten the "Slacking Test" and at the same time insure enough water for a complete slacking, we have taken for a working basis a 96% calcium oxide lime and determined the amount of water necessary to slack it and in addition, the amount of water that will be driven off by the heat of slacking. In addition to this when computing the following curve we made no allowance for the water equivalent of the dish used in slacking the lime, which gives about 2 C. C. extra water and makes the amount perfectly safe.

The foregoing chart will show the amount of water to add in "Slacking Test" after determining water due to air slacking from the CO_2 and loss on ignition test.

Slacking Test

Weigh 50 grams of coarse lime from the sample bottle in a crystalizing dish 3½" in diameter and 2" deep. Add amount of water given in above chart and allow to stand covered until slacking is complete. Place in an electric oven heated to 180°C. for one hour with cover on, then remove cover and heat for another hour. Remove from oven, replace cover, cool in a desiccator, weigh, and record the weight. Place in the oven again for another hour, cool in desiccator and weigh again. Repeat this heating an hour at a time until the weight is consistent, or shows an increase due to formation of carbonate while drying. This will not require over four hours and is very often completed in three hours, the second weighing showing an increase over the first.

An ordinary drying oven heated to 100°C. can be used, but it requires a longer time to reach a constant weight; and as there is more circulation of air through it, the gain due to formation of carbonate is higher.

Whatever form of oven is used, it should first be checked in order to determine the necessary correction. This can be done by allowing the slacked lime to remain in the oven with the dish uncovered for several hours after it has become constant, and noting the increase in weight, then divide this increase by the number of hours, and determine the correction for each hour.

The correction we have determined for our electric oven is .03 grams for each hour the sample of lime is in the oven. When the weight of the dried lime has become constant or shows an increase over the preceding weight, the difference between this weight and 50 grams, the original weight of lime taken, is due to the water taken up by the active CaO in slacking.

$CaO + H_2O = Ca(OH)_2$ Slacked lime. From this amount of water found we subtract .03 grams for each hour the sample was in the oven to make correction for carbonate formed while drying.

The remainder is then multiplied by 2 in order to determine amount of water taken up by active CaO in 100 grams of lime.

It is now a simple matter to calculate the percentage of active CaO present in the lime.

Add the water due to air slacking, which was found by the loss on ignition and CO_2 tests, to the water found by slacking the lime, and the total will represent the amount of water combined with the active CaO in the lime tested.

$H_2O : CaO =$ total combined water : x(Active CaO)
18 : 56 = " " " : x(" ")

The following example will make the steps more clear:

Loss on Ignition	4.5%
CO_2 determined	.8%
Combined water due to air slacking	3.7%

Referring to the chart shows that 27.2 C. C. of water should be added in the Slacking Test.

Constant weight of dish and lime after slacking and heating	152.02 Gr.
Weight of dish + 50 grams of lime before slacking	140.65 Gr.
Water taken up by Active CaO in slacking	11.37 Gr.

SAMPLE—		No. 1	No. 2	No. 3*	No. 4	No. 5	No. 6	No. 7†	No. 8‡	No. 9	No. 10
ANALYSIS OF LIME	CO_2	.52%	.33%	.28%	.68%	.52%	.50%	4.46%	2.07%	.42%	.29%
	H_2O	.90%	.80%	1.34%	3.16%	2.64%	2.51%	6.49%	.96%	1.46%	.70%
	SiO_2	.34%	6.21%	6.41%	1.76%	2.49%	4.52%	.53%	1.38%	9.54%	8.99%
	Fe_2O_3 plus Al_2O_3	.15%	1.88%	2.38%	.50%	1.83%	1.37%	.58%	.68%	3.56%	3.07%
	CaO	93.27%	87.58%	86.19%	89.38%	90.49%	88.59%	81.95%	91.91%	81.17%	83.16%
	MgO	4.25%	2.68%	1.79%	1.49%	1.13%	1.64%	4.21%	2.28%	3.12%	3.04%
	SO_3	.57%	.52%	1.25%	2.71%	.80%	.63%	1.78%	.12%	.73%	.75%
Slacking Test (Active CaO)		91.88%	76.90%	78.77%	83.23%	87.91%	84.51%	74.39%	88.98%	63.00%	66.80%
Causticizing Test (Active CaO)		88.94%	69.80%	71.02%	78.42%	80.78%	75.23%	72.19%	85.92%	54.21%	59.08@
Lime Used per Pan in the Mill		4.000#	4.800#	4.800#	4.400#	4.200#	4.300#	4.900#	4.200#	5.800#	5.500#
Causticity of Digester Liquor		94.00%	93.91%	94.21%	93.90%	94.09%	93.87%	94.00%	94.22%	93.74%	93.91%

* Silica not quite so much fused as in No. 2; while total CaO was less, the active CaO was higher.
† Very small amount of active CaO lost due to Silica, and note how much nearer the causticizing test comes to the slack test.
‡ Very rapid slacking lime.

Sample heated in oven four hours, therefore the correction is $.03 \times 4 = .12$ grams.

11.37 grams — .12 grams = 11.25 grams.

$11.25 \times 2 = 22.5$ grams + 3.7 grams = 26.2 grams

of water combined with Active CaO in 100 grams of lime.

$$H_2O : CaO = 26.2 : x(\text{Active CaO})$$
$$18 : 56 = 26.2 : x(\text{ " " })$$
$$\text{Active CaO} = 81.51\%$$

The Slacking Test method, while dependable, is very simple, can be readily handled by any person on control work, and lime used in the mill in accordance with the results obtained.

The writer has compared the Slacking Test with the causticizing method on all grades of lime and carried results into the mill, and the accompanying table is compiled from this comparison.

The Human Factor in Production and Cost Accounting

By GEO. D. BEARCE, Engineer, and G. A. WARE, Accountant
News Print Service Bureau

IN THE paper industry, as elsewhere, the human element is acknowledged to be one of the most important factors. The relations between the worker and management have been the subject of extensive study, but it is not less important to consider the co-operative efforts of those more directly influential in economical operation. Included in this group are:

1. The superintendents, production and service engineers, or other department heads responsible for the actual operation of the plant.
2. The accountants who are responsible for presenting a clear and concise record which will show not only the results already obtained, but which will indicate the course which should be followed in the future.

It is an unfortunate fact that these two groups are often widely separated as to ideas and functions. This condition and the human element involved requires a careful study to eliminate, if possible, the lack of co-operation.

When removed from their respective pedestals of specialized knowledge, the cost accountants who talk in terms of the cost of material, direct expense, overhead, etc., and the superintendents and engineers who figure production, kilowatts, equivalent evaporation, free SO_2, etc., are all found to be working for the same common cause in the paper mill, namely, to make the best product by the most efficient method at the least expense. Being thoroughly human, each one is intensely interested in the progress of his particular work and department. With such specialization there is a great tendency to overlook the importance of the work accomplished by the other fellow and for each to regard his own department as the essential one in the entire plant.

Every department has its function and each is one section of the foundation necessary for the successful operation of the plant. Even though the character of the work of the cost accountant varies greatly from that of the production, chemical, steam and other engineers, the methods of obtaining results are closely allied and each is dependent upon the other to a large degree for information and assistance. Consequently the value of co-operation and co-ordination of effort can hardly be overestimated.

In the analysis of a plant engaged in the manufacture of paper, it is found that there are a large number of overlapping problems that are vital to both the production and the accounting departments. Some of the most important of these are:

1. Measurement of raw materials used in the product.
2. Measurement and distribution of power consumed.
3. Records to facilitate proper cost distribution.
4. Methods of determining correct inventories.
5. Proper apportioning of depreciation and burden charges.
6. Practical and adequate statistical records.

Measurement of Raw Materials Used

The correct measurement of the raw materials used in the paper mill is perhaps the largest and most important of all the problems. Without these vital figures the accountant is unable to establish a basis for his total and unit costs. The production and service engineers can greatly assist in determining the amounts of wood, coal, pulp, lime, sulphur, etc., consumed. It may be necessary to install or devise special apparatus to measure some of the materials, but both the engineer and the accountant will receive the benefits derived therefrom. The latter will receive correct reports upon which to base his costs, and the former is assured of reliable data that may indicate the possibility of more economical methods of operation and elimination of waste.

Measurement and Distribution of Power

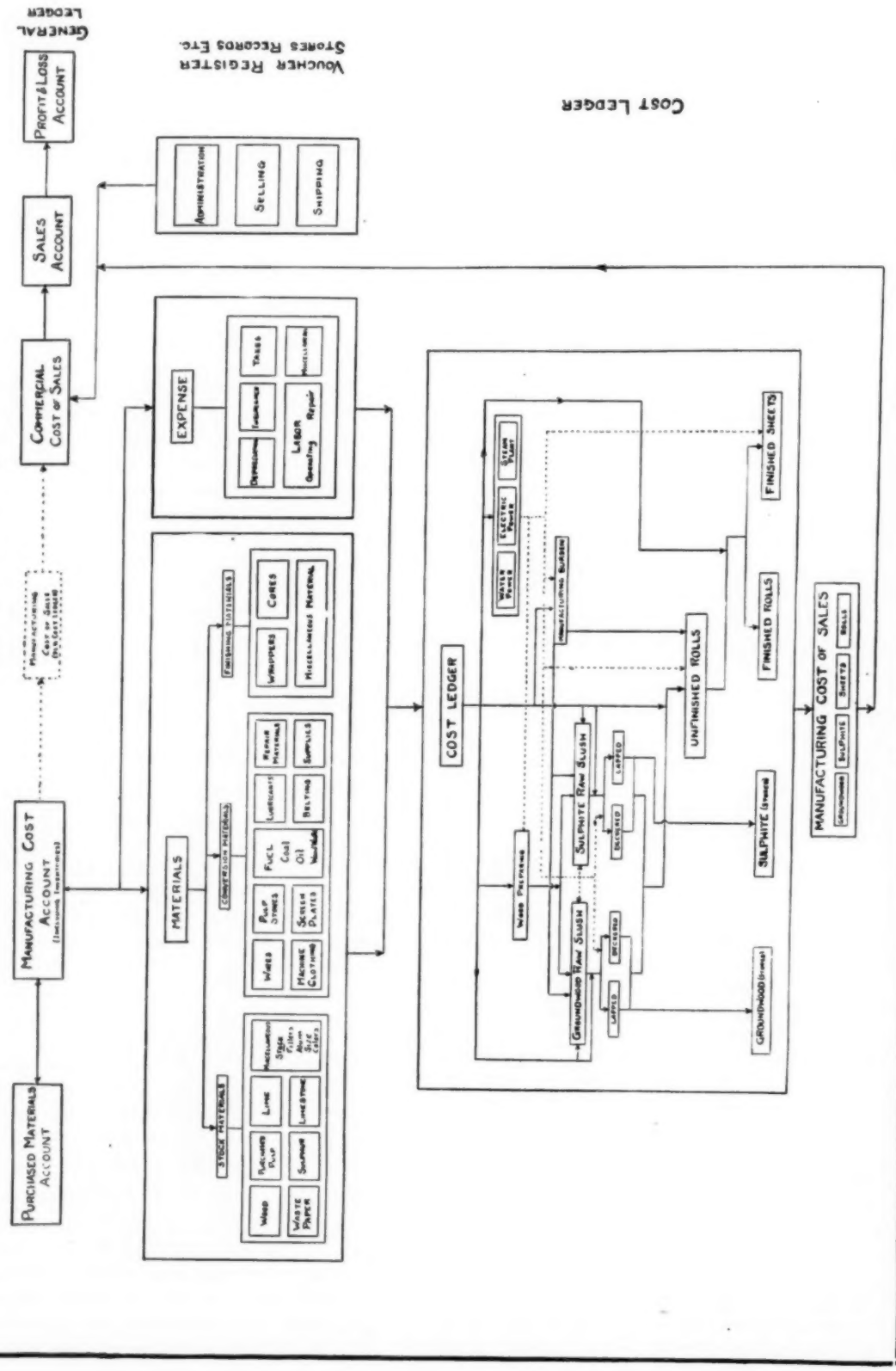
The distribution of power is a very important factor in costs, because of the vast amount of mechanical, electrical and steam power used in the manufacture of paper. Power must be charged to the proper department and the accountant is largely dependent upon the engineer for this information.

FIGURE 1

GRAPHIC CHART OF OPERATING ACCOUNTS

FOR

NEWSPRINT PAPER MILLS



The importance of obtaining the correct distribution of this item is obvious in the cast of newsprint rolls where the power cost is approximately 40 per cent of the total conversion cost. The unit cost of the finished rolls is seriously affected by an incorrect application of the power charge. Naturally the operating engineer is vitally interested in the quantity and cost of mechanical power used because this expenditure often reflects the efficiency of his department.

Records to Facilitate Proper Cost Distribution

All the records of materials used, power consumed, etc., that the accountant uses as a basis for his costs, must originate in the mill, and it is obvious that these fundamental data must be correct. The production and service engineers are responsible to a large degree for the exactness of such information. Automatic recording instruments are preferable whenever their use is possible, because the uncertain human factor is eliminated. It is a well recognized fact that the average workman dislikes to keep records and if it is not feasible to have a special clerk to obtain the information, the accounting, engineering or operating departments should keep a close check on such records. All records should be simple, adequate, correct and immediate.

Methods of Determining Correct Inventories

The calculation of the quantities included in the physical inventories of raw materials held in storage by the average paper mill is a problem that is within the scope of the engineer and outside the field of the accountant. This information is needed by the latter to check the actual amounts of the various inventories against their respective book values in order to make proper adjustments and eliminate as far as possible any overruns or shortages. Standard methods of procedure should be worked out for the measurement of pulpwood, coal, limestone, lime, sulphur, clay, etc., and practice and experience will tend to produce accurate and reliable information, with a minimum amount of work.

Proper Apportioning of Depreciation and Burden Charges

Although standard methods have been worked out for calculating depreciation of buildings, machinery, etc., it is often necessary for the accountant to classify assets under different groups in order to arrive at the correct department charges. The assistance of the engineering staff is necessary in this work and in the establishment of the rates to be used for the different groups. The engineer should also be consulted upon the method of distributing burden charges because of his knowledge of operating requirements and conditions.

Practical and Adequate Statistical Reports

Although the statistical field is closely allied to cost keeping, the average accountant often considers the preparation of simple and timely operating statistics outside of his field. This has led to the development of a separate technical department in many mills to record and chart current information required by the management to keep in touch with operating conditions. The duplication of work sometimes occurring makes it desirable that the cost accounting and technical control departments cooperate to the fullest extent. In the former case the operation of the plant is reflected in terms of dollars and cents, and in the latter in terms of quantities and efficiency percentages. Fundamentally the figures of both should indicate the same results and the two departments should develop along parallel lines.

The foregoing outline of the mutual problems of the cost accountant and the production and service engineers brings up this question. How can the best co-operative results be attained?

To come back to the human element entering into such a relationship, it seems that the first step can be accomplished by an exchange of ideas, information and viewpoints, together with a mutual study of the problems. The accountant must show the engineer that he does something else besides "juggle" figures, and the engineer must prove that he does something more than "guess" with the slide rule. The beneficial results obtained from good team work are fortunately becoming increasingly realized. Both engineers and cost accountants will do well to recognize the various points of contact where they can be of mutual help to each other. It has often been erroneously thought that one of the chief functions of the cost accountant is to prepare statements which will expose the inefficiencies or failures of those in charge of operations. It is true that the cost statements should expose inefficiencies, but the accountant will immediately lose the co-operation of the engineers if, in calling attention to the facts, he does so in such a manner as to suggest the desire to "put one over on the other fellow." Instead let him confer with the engineers to get their viewpoint and the true cause affecting the case. By doing so he will exhibit that true spirit of co-operation which will show that one of his chief duties is to assist the operating men in every way possible to obtain the best results.

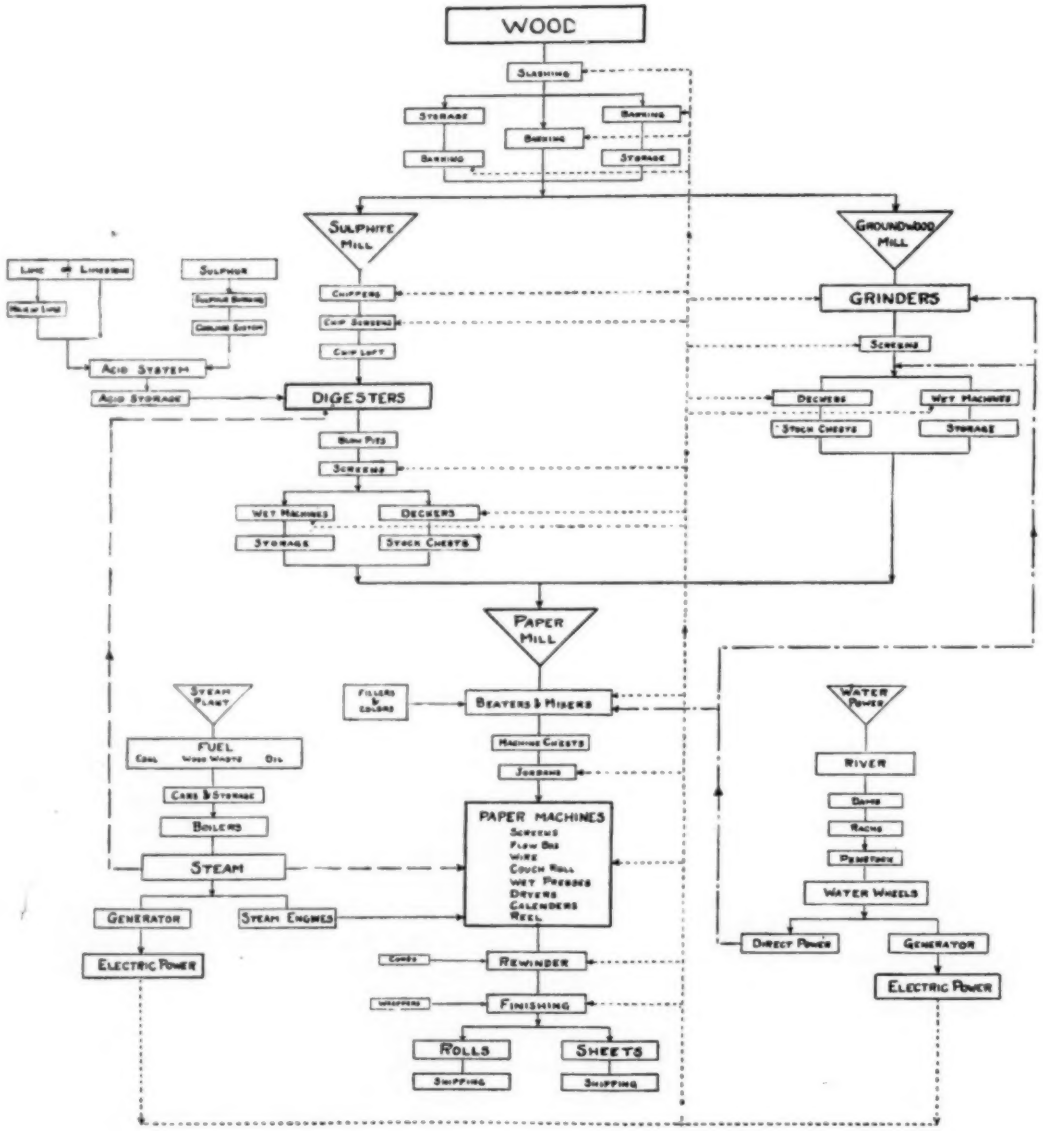
One of the most effective methods of getting the other fellow's viewpoint is by personal contact and discussion, and regular meetings between accountants and engineers have been productive of excellent results in solving many mutual problems. It is of course necessary that the accountant should be conversant with the processes of manufacture and the engineers should understand the general principles of the cost accounting system, which should adequately reflect the facts in their proper relation to the various operations. A chart showing the division of the various accounts would be of great assistance to the engineer in undertaking this general plan and

FIGURE 2.

FLOW OF MATERIALS AND POWER

IN

NEWSPRINT PAPER MILLS



likewise a diagram of the processes of manufacturing would be helpful to the accountant.

Figure 1 illustrates a chart of operating accounts in a newsprint mill which, together with the cost statements, will facilitate intelligent study and discussion in the suggested meetings. Figure 2 indicates the flow of principal materials and power in a newsprint mill. Charts of this type should be prepared by individual mills to meet their own requirements, as these are only general illustrations.

The establishment of a basis of mutual understanding should lead to the combined effort of all concerned in solving the common problems. Better and more accurate methods could be devised for the measurement of raw materials. The engineering departments would be encouraged to make special studies of new automatic measuring instruments and to keep the existing equipment in good running order. A survey of power consumption might easily lead to economies in this field. The service engineers would have confidence in cost figures that they fully understood and would be more likely to find a way to effect savings through the information contained from a comparative study of cost statements. More correct physical inventories will be determined because of detailed studies by the engineering departments and the reduction of overruns and shortages in the principal stock materials would result in more accurate cost figures, thus giving the management a firmer basis upon which to establish selling prices.

Cost finding problems are so closely allied to those of manufacturing that the development of an adequate but not overelaborate cost system will be the result of the combined efforts of the accounting, production and engineering departments. The entire problem presents intensely interesting possibilities. A definite plan of procedure, together with some human engineering should produce valuable results in increasing production, diminishing costs and creating better operating conditions.

The Fine Paper Industry as Seen by the Manufacturer

By NORMAN W. WILSON
Vice-President, Hammermill Paper Company

Address Before the Third Fall Business Conference of the American Paper and Pulp Association on November 3, 1921, at the Drake Hotel, Chicago

AS A preface to that part of to-day's symposium which has to do with the fine paper industry, embracing book, cover, tissue and writing papers, I wish to express deep appreciation for statistics, advice and suggestions that have been supplied by the secretary of those four divisions of the fine paper industry, to Mr. Raybold, to Dr. Baker and to the presidents of the Book, Cover, and Tissue Associations as well as to others who have wholeheartedly come to my assistance.

The subject is rather a large one and I have approached it with much misgiving, recognizing that there has been a tendency to form opinions and present them as conclusive, sometimes forgetful that there never has been a period just like the past eight or ten months and that the world, politically, socially, industrially and financially is somewhat different than ever before.

I offer nothing new in calling attention to the fact that at the termination of the world war, or to be more precise, when the Armistice was signed, the relations existing between the various countries were unnatural. The industrial pause which followed that date was rather a natural one and the return to business activity, after a resonable time of depression, was to have been expected for we were all weary of the strain of war and the feverish production of sufficient materials to carry on the War directly and indirectly.

Much money had been made by companies and individuals in all walks of life, and it was natural that all should welcome an opportunity to invest for profit and to spend for luxuries as well as necessities, and it is now rather generally recognized that the period starting in mid-summer of 1919 and continuing for upwards of a year could well appear as a fever chart. Indeed we all so regarded it at the time, with many warnings exchanged though with all too little seriousness, that the day of settlement would surely come and that we should all be preparing for a return sooner or later to lower levels.

During the War itself, we were inclined to expect to return to pre-war costs of materials, labor and sales levels and the best that was hoped for was that the return would be orderly and without too much confusion and loss.

During the super inflation of 1919 and 1920, it became more apparent that a time of stepping down was inevitable but pre-war prices began to seem less likely so that eventually we came to look for a new level somewhere between the high peak of 1920 and the old levels of 1913 and 1914. There were those

who held that it would be years and years before costs and sales levels could make very much headway downward. The cost of living throughout the world had increased enormously. The return to labor, unskilled and skilled, and to managerial labor and to capital, had risen with a fair degree of uniformity. The keystone of the entire advance seemed clearly to be the higher return for service rendered individually and collectively, and so it was pointed out that raw materials, semi-finished and finished goods would continue to cost very much more than in the old days and, therefore, the entire scale would naturally be higher.

That other countries were not so well established with a flexible currency was given too little consideration, plus the fact that after all the business of this country must depend to some extent upon the interchange of goods all over the world. It seems apparent that the depression which finally reached our industry only within the last twelve or fifteen months, actually commenced in far off Japan and then moved up, step by step, as other countries were affected and later as other industries within our own country became depressed. You are all familiar with the reasons and know that they were a combination of the elements that go to make up the social and industrial world, but basically they were financial first and then perhaps psychological next.

We had been consuming more than we needed; wasteful in material, in time and in money; we had been purchasing more than we consumed; as manufacturers we had let down in the economical usage of materials; we had let down individually, and with our employees, so far as production is concerned; our purchasing departments had reached out for more than the usual amount of supplies and had thereby, consciously or unconsciously, given encouragement to further inflated costs. Our merchandising friends were guilty of the same faults; their customers likewise.

From Over-Consumption to Under-Consumption

It took but a short time to proceed from a period during which we over-consumed, over-purchased and under-produced to one of under-consumption, short purchasing and over-production.

The stoppage of foreign sales alone set us to thinking. Industry after industry slowed up. With the exception of the foreign markets, the actual consumption of our products slowed up relatively in only a minor way, but as that consumption did slow up, every unit of distribution, beginning with the consumer, headed back to the wholesale merchant and finally pyramided upon the manufacturer, leaving him with practically no sales and therefore no income to pay expensive organizations and to help carry a tremendous load in the form of expensive raw materials.

Much has been said against and for the moves that have been made by the paper manufacturer to again set in motion the demand for his goods. At first there was perhaps a good deal of feeling that the troubles of the manufacturers could have been offset by more loyal support from the paper merchants; from the converters of paper into finished goods and from the customers of the merchants and the converters. On the other hand, the paper merchants and the paper converters, and their customers too, doubtless felt that the shoe was on the other foot and that their troubles could have been alleviated by quicker action in price revisions by the manufacturers.

Looking back over the painful period of readjustment downward, I believe it is now well agreed that the condition could not have been helped very much because we had all been operating upon an unsound basis. We had all contributed to the causes of the inflation and it was necessary for us all to participate in the sacrifices that had to be made in order to get our industry back into a reasonably healthy condition.

It is a fact that beginning late in 1920 and extending almost continuously up to the last month, the fine paper manufacturers participated in a series of price reductions, every one of which anticipated rather than followed any justification for a lower sales level so far as cost of production is concerned. Every one of the moves was made in recognition of conditions that needed to be met by a lower level of prices rather than by an ability from a cost standpoint to make those reductions.

So far as I am able to learn, every manufacturer of fine paper has shouldered his burden in the form of financial sacrifice. By this I do not mean a mere reduction in profit; I refer rather to actual operating loss. I mention this point mainly for the purpose of emphasizing the fact that the manufacturers of fine papers have not attempted to stand in the way of readjustment but instead for months have been supplying to their clients the major part of their production at prices that continually ran below actual costs.

There is no question but that the revisions in price have meant loss to our customers, but they have accepted their losses in an equally good spirit and in the opinion of the fine paper manufacturers, the merchants have done all that could reasonably be expected to protect our interests and the industry as a whole just as we have aimed to proceed intelligently for the good of us all.

When we last met in general conference, the major part of this year's painful industrial program was still before us. For weeks most of us had found our business stagnated. Other industries were becoming more and more stagnant. The usual dull summer season was before us.

The statistics for book, cover, tissue and writing papers are so similar that we can properly deal with them as a whole.

At the end of the first quarter of this year, the

manufacturer was fortunate who was able to operate to 50% of his capacity. His orders were running much below that figure. The stocks at the mills had become enlarged because the manufacturers were reluctant to shut down entirely even after cleaning up all unfilled orders and accumulating normal inventories of finished goods.

We understand that the stocks on the merchants' shelves were rather substantial considering the slow up in turn over, which had occurred during the preceding four months. Production, orders and sales continued relatively the same for the second quarter. However, the third quarter brought up the average so that for the first nine months of this year the production of fine papers was only 39% less than for 1920. Meanwhile the stocks at the mills increased only 4% and the merchants' stocks we are told have declined about 25%.

Consumption Increasing

The consumption of book papers may be measured to a large extent by the activities of the printing and the magazine publishing industry; the consumption of cover and writing papers may be measured by the activities of the printing industry alone. While it is true that the magazine publishing tonnage has been severely affected by a decrease in advertising, amounting to 37% less than 1920, still this year's advertising is but 19% less than 1919 while it it actually 10% higher than 1918. We understand that advertising campaigns by large concerns are laid out for next year to be very aggressive and for perhaps larger expenditures than ever. Authentic reports from the United Typothetæ indicate that the printing industry has been speeding up rapidly. The low period was reached during the printers' strike in May when the index of production was reported at 57%. Since then there has been an increase to approximately 84%. This is equal to, if not in actual excess of the percentage that is being ordered from the mills even now, so that consumption seems to be running ahead of demand in the form of orders received.

The tissue paper industry was one of the first branches to recover from the severe depression and the demand for tissue, particularly lower grades, is now better than normal. The period of depression reached the tissue mills before either of the other three divisions and it is most encouraging to note that tissue is now leading the way back to capacity production.

In all four branches of the fine paper industry it seems definitely established that a great deal more tonnage was ordered during 1919 and 1920 than was consumed and that during the present year much less has been ordered than consumed. The one naturally follows the other because when business slowed up this year, there was a surplus of tonnage in the hands of the consumer, the printer and the lithographer. We are informed this has been practically all used up—the merchants' stocks are less and our own stocks are commencing to run on the light side.

Orders placed with the book, cover and writing manufacturers have taken a decided upturn, particularly in September and October. Some of the tonnage perhaps has been ordered because of the threatened railway strike, but the actual upturn commenced well in advance of any agitation of this question whatever. It is significant to note that if our statistics are correct, the orders being placed with the mills, even during the past few weeks, are only running about parallel to the sales reported by the paper merchants so that there still exists a decided shortage of paper on the merchants' shelves.

Bit by bit, other industries are getting back to fuller running scredules, and we all recognize that we are so closely interlocked with other industries that every impulse which the others feel is almost immediately transmitted to us.

Then too, and perhaps most important of all, the uncertainties of the past ten months have in the main been removed from our own minds and from the minds of our customers. The campaign of frank and correct statements to each other and to our customers is bearing fruit. Each of us know and the industry as a whole knows, that the water has long since been wrung from the prices now being asked for fine papers. Everyone knows that the last reduction came right out of the hides of the manufacturers and that even at full or practically full operation, he will be fortunate indeed who avoids an operating loss for a long time to come.

The important raw materials are not likely to become cheaper while materials on hand have already been written down in price to as low or lower a figure than they can be replaced for. This certainly seems to apply to such important materials as rags, wood and coal. Wood pulp, like paper, has been forced to a level lower than it can be produced for. Largely because of this fact the production has been absolutely stopped in several important mills.

Due mainly to the low value of foreign currency, foreign pulps have been sold in this country at prices that have actually jeopardized the existence of our domestic mills. It is because of this fact that converters, as well as manufacturers of pulp, have seen the need for some adequate protection in our tariff laws. However, much of the pulp which has been imported has been so far below the old standards of quality that the tonnage while sufficient to depress the market, still has been rather minor in volume. I refer particularly to those grades of pulp which are used in the manufacture of fine papers. Labor has declined quite considerably, but with business increasing, labor will probably be less inclined to work diligently at any lower rates. Then, too, the fine paper manufacturer is studying the wage question with intelligence and broad vision. There seems to be a desire on his part to pay the highest wages possible, consistent with the price received for his finished

goods. His aim is to attract and tie to the industry the very best class of workers so that both quality and output can be maintained to the highest degree possible.

Upon the completeness of our data of past experience, upon the soundness of our analysis of its meaning, and upon the accuracy of our estimates for the future, will necessarily depend the success of any attempt to look into the future.

The Return to Profitable Operation

If it is true that our materials and the workmanship which produces our finished products, are not likely to soon decline further, if our sales level is now established, and if, therefore, the cost on one hand and the selling price on the other is now somewhat firmly fixed, there are really only two methods of procedure that will return us to profitable operation.

The first is to accomplish greater economy in the cost of operating each department of each business. By this I mean less wastage in the use of materials and time; closer and more intelligent supervision by the managing heads, an example of greater contribution by each of us in his own work; greater and better production from one end of the business to the other. The merchant and printer can well afford to be thinking along similar lines.

It is not reasonable for us to expect too rapid improvement in this respect, no matter how much we desire it. True it is that after the painful experience of the past eight or ten months we are justified in expecting rigid economy on all sides and a return to efficiency so far as the purchase and use of our materials are concerned. However, after a long period of part time operation we must expect to find our employees somewhat slow to return to high speed production.

Much can be accomplished by a patient and intelligent effort to show how decreased production per hour automatically increases the cost of production per unit and how this in turn prevents successful competition with papers made either at home or abroad and it is possible to show how inability to compete because of high production cost in turn means smaller sales, and, therefore, fewer hours of operation for each employee as well as a greater loss to our companies because of excessive overhead charges.

It is also possible to show how this result is likely to force the companies to pay lower wages per hour in the effort to get back into a competitive position.

It is obvious that the more rapidly our goods move and the more orders we obtain, the longer the runs will be on the paper machines. This in itself means better production and less shrinkage in finishing.

The second recommendation is that we conduct our merchandising campaign in an equally intelligent manner.

The red ink figures on our monthly balances show all too well the fallacy of striving for greater tonnage at lower prices, at a time when our prices are already so low that were we running full time and at a high hourly production rate, there is little opportunity of showing a profit. Our customers, including the merchants, printers, converters and their customers too, are not interested in lower prices provided they are safe in buying at present levels. Our aim, therefore, should be to keep them frankly and fully informed; to give them the utmost value not only in reliable quality, but in rapid fire service and in practical assistance in remarketing the goods they buy from us. It is our duty to combine forces with them and to develop new markets; to speed up distribution and to find and develop new usages for our product. The results that have already been accomplished along these lines show conclusively that we will all be repaid to the extent that we earn the reward.

Obvious and elementary as these two recommendations may be, still I have offered them without embarrassment, because after all we are prone to seek fanciful methods rather than follow the dictates of strict common sense.

It is perhaps true that to some extent the present generation has backslidden morally and in some other directions. Nevertheless at no time in the world's history has mankind so thoroughly realized that only by advancing each other's interests can we advance our own. As nations, the same fact is at last almost universally recognized. It may take years for us to again like the Central Powers and for them to care much for us, but surely every sound thinking person now recognizes that neither they nor we can obtain the full measure of industrial or social happiness until we and they again meet on some common ground with the affairs of the past, not necessarily forgotten, but at least subordinated to a clearer understanding of each other's rights and obligations. The same may be said about relations of all nations to each other. This has been preached for centuries, but the last seven years has put the finishing touch to any additional proof that was needed. The same reasoning may be applied to interstate relations and to the relations between our various industries.

We have seen, as never before, that our industry suffers when other industries suffer and that we prosper when the others prosper. We have seen that the merchant and his customer, the mill and its clients prosper or suffer to the same relative degree. Surely we have every right to look the future fearlessly in the face, realizing that the strains of inflation and the pains of deflation have after all brought us closer together and prepared us better than ever for meeting, side by side, any issue that the future may hold for us. We have scaled heights that this generation surely will not have to face again; we have suffered a depression which is equally unlikely to recur. There will be jolts and jars always. In this we should find happiness, for after all in those jolts and jars lie opportunities for character development for lasting friendship and for financial profit.

Straw Pulp as a Substitute for Ground Wood for Newsprint

By WALTER CLIFFORD, CH. E.; ASSOC. M., A. M. S. E.
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ALTHOUGH at the present time there appears to be a plentiful supply of wood suitable for newsprint in eastern Canada and New Foundland, the sources of supply in this country have been gradually growing less for some years past, and the time is not very far distant when the United States, as a source of supply of newsprint, will be eliminated, unless some suitable substitute is obtained for ground wood, and in order to be of any commercial value it must be capable of reproducing itself yearly. Looking over the probable field, about the only material that satisfies the above conditions is straw, which is available in large quantities in the grain producing areas of the United States and Canada, and which at the present time has practically no commercial value, and is either burned or plowed under as a fertilizer. So the question naturally arises—Can a pulp suitable for newsprint paper be produced from straw? And with the idea of solving the problem, a number of experiments have been conducted which appear to give results of a satisfactory character.

When it was decided to use straw as a raw material for these experiments, the question naturally arose in which process, sulphite, soda, or sulphate, will it give the best results for the least money. The answer to the question is that a modification of the sulphate process for this purpose gives results far superior to those which can be obtained in any other process, and owing to its great elasticity is probably superior to all others, since it can be built in units right in the field of 35, 70, and 105 tons, etc.; that is, a sufficient number of small units could be erected at no great cost which would produce enough pulp for one or two machines right in the district where the straw is produced, and where there are at present no possibilities for the manufacture of newsprint, the pulp having to be brought from great distances. This constant source of supply would therefore be of great benefit to the news print publishers of our northwestern states and the prairie provinces of Canada, especially so for the latter, as a large natural deposit of salt cake has recently been discovered in Saskatchewan, and is only waiting for uses in order to be assured of full development. A development along the lines suggested would be an unfailing source of supply of newsprint in those districts where it now has to be transported the farthest distances, would provide a profitable market for a raw material at present on the ground, and which is being wasted, and could be built in such convenient units that it would be capable of supplying the needs of each district from which it derived its raw material. In other words, the district from which the straw for a one unit mill would be obtained would be capable of using up the finished product; this is an ideal condition from an economic point of view.

As usually constructed, a sulphate mill is built in one, two, three, or more units, the number of rotary incinerators determining the production and the size of the mill, a one unit mill being capable of producing 25 tons of wood pulp per day, a two unit 50 tons, etc., but in the modification of this process as proposed for using straw as a raw material instead of wood, owing to the smaller consumption of chemicals on straw, a unit which would have sufficient reclaiming capacity for 25 tons of wood pulp will give about 35 tons of straw pulp, or the amount required per day for a medium sized machine.

As is well known, the sulphate process is really a modification of the old soda process. Straw has been cooked in the soda process for a number of years, both experimentally and in some instances commercially, but owing to the unsatisfactory yield, has never been developed to any great extent. Some straw has been cooked also in the sulphite process, and various modifications of it, but owing to the fact that small sulphite units are expensive to build in proportion to the tonnage obtained, the cooking of straw with sulphite process has never passed the experimental state. This left the sulphate process or a modification of it the only field capable of development. This being the case, the experimental work was conducted more extensively on the sulphate process. One of the great difficulties in the use of straw for pulp purposes up to the present and the chief objection to its use have been (1st) The bulkiness of the straw which made it difficult to handle; (2nd) When cooked with lime or soda, which I understand has been done to a certain extent in Ohio and other parts, the manufacturers were forced to abandon the process on account of pollution of streams with lime; this can be overcome by installing small lime recovery units which recover lime and allow it to be again used in system; (3rd) Very low yield.

Difficulties, (1) and (3), could be overcome in the following ways: The first, by inducing the producers to install small baling presses at source of supply; in this way each producer could handle his own straw

moved from it and from there direct to beaters. Very little beating is required; it is then ready for machine. The beauty of the whole process is that it is so simple that everything can be handled mechanically and is almost automatic; very little labor being required after cooking.

The controlling factor of the whole process is the cooking liquor. Liquors of various strengths and density were tried, and of many degrees of causticity and sulphidity, but the liquor which was found to give most satisfactory results, highest yield, and lowest cost of bleach was one which contained only a small proportion of caustic or a low causticized liquor. It was found that this liquor was the most satisfactory, being only about 12° Bé. where the percentage of caustic was one-half the percentage of sulphide. That is, if liquor contained 25% of sodium sulphide (Na_2S), the sodium carbonate should only be causticized sufficiently to give about 12½% of caustic soda (NaOH). The cooking liquor would then have an approximate composition as follows:

Sodium sulphide (Na_2S)—25%
Sodium Hydroxide (NaOH)—12½%
Sodium Carbonate (Na_2CO_3)—62½%

By using a liquor of this composition the whole process is greatly simplified, as only a portion of the liquors coming from dissolving tanks (smelt) need be causticized, thus very materially cheapening the process as compared with straight sulphate process; and value received from it would in a short time pay for baling press.

The yield in the modified process to be described is very greatly increased, being between 65 and 70% of the original straw. The straw pulp, when cooked, is of a yellowish color which can be brought up to newsprint standard color with a very small amount of bleach, and a satisfactory sheet of print paper can be made from the straw pulp alone. No other raw material need be bothered with.

Process Described

With these preliminary objections overcome I will now describe the complete process as finally worked out, which will give a pulp absolutely satisfactory for news print, and which can be made into print paper in the straw producing centers of the United States and the prairie provinces of Canada. It would also be of inestimable benefit for such countries as Australia, where there is practically no suitable wood for the production of news print and which has an abundant supply of straw. The same process could also be used on rice straw which would give the rice producing countries a supply of raw material suitable for news print and other cheap paper right at home.

As the straw would be expected to reach the mill already baled, there is no need to unbale it, as a suitable machine, similar to a chaff cutter and of sufficient size to take the bales, could easily be designed. The straw is cut into about one-half inch lengths in the machine and blown from it by means of air currents to a number of tanks, where it is thoroughly agitated and allowed to soak from three to four hours in black liquor of about 9° Bé. obtained from a previous cook. It is then pumped to the digester, where sufficient cooking liquor is added, after the excess black liquor has been drawn off through false bottoms in the digester by means of a pump, the suction of which tends to pack the straw, which is now considerably softened, so that it becomes packed quite tightly in the digester. This enables the digester to hold about 70% as much straw as it would of wood. The cooking liquor is then added, the digester steamed, as in ordinary sulphate process, and cooked about two hours. The digester is then blown, pulp washed, and liquor recovered as in straight sulphate operation. A considerable saving is made in cost of production and in initial investment required, owing to the fact that no screens are required, as there is nothing left in the pulp that would be objectionable in news print. After washing, the pulp is run over a suction thickener and from there to a Kollergang, where it is treated continuously. As very little milling is required, the pulp goes in one side and is then discharged directly into the bleaching system. It is then bleached, taking about 3% of 35% of bleaching powder to bring it up to news print color. From the bleaching system it is pulped through a wash system consisting of octagonal washers, where spent bleach liquor is reas very little lime is required. Instead of trying to causticize each liquor to around 12½% of causticity it is much better to causticize about one liquor in four to full causticity and then mix, putting causticized liquor with green smelt liquor until it contains the right proportion of caustic. This simplifies the whole process and very materially decreases the original cost of plant, as tanks, etc., for extensive causticizes are not required. It is estimated that a plant for the production of news print paper by the preceding process could be constructed for around $25,000 per ton of paper per day. This compares very favorably with modern news print practice, where large power development is required and extensive wood operations have to be conducted, and the news print transported long distances to the ultimate consumer. The process, when fully developed, should be of inestimable benefit to certain sections of the Middle West, because of the fact that it could have a steady supply of news print, right in their own vicinity, produced from materials near at hand, and should go a long way to relieve the shortage of news print which is bound to come owing to the depletion of our wood supply. In fact, it would make it possible to greatly prolong the life of our present pulp wood supply by providing a substitute for that class of paper which is now using it most rapidly.

Six Definite Things That Workers Want

A Hearing Higher Up

By JAMES H. COLLINS

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LOOKING ahead last summer, the management of a large eastern factory saw that, within six weeks, there must be a reduction of the work force. Ten percent of its employees would have to be laid off—maybe twenty. Sales were falling, products accumulating in storage instead of going to customers, and in borrowing money to continue production, the company had about reached the limit.

Hard necessity, and bad news for many a wage earner, but a common enough story these times.

That factory is operated on John Leitch's plan of Industrial Democracy. It has a "cabinet" made up of its executive officers, a "senate" composed of managers and foremen, and a "house of representatives" elected by employees, one delegate to each thirty or forty people.

A mass meeting of employees was called together, and the president laid the situation before them. There could be no difference of opinion about the grim necessity for laying off some employees.

"You don't have to tell us that business is bad," said one employee-spokesman. "We read the newspapers, and know what's going on."

"Well, then, we want you to advise the management in making this reduction," replied the president. "Tell us who you think ought to be laid off."

Every worker in that plant has a personal efficiency rating. Under the system, each employee has access to his own rating card, and knows exactly where he stands. Class A employees are the leaders in production, standing highest in quantity and quality of work, as well as in adaptability—they understand working methods in more than one department, can be shifted if necessary, and are capable of taking responsibility and supervision. Class B employees stand high in output and quality, but are less adaptive, being familiar chiefly with one task or department. Class C comprises all the employees who have failed to fully measure up to the standards and opportunities in a single department, sometimes lacking ambition, again conspicuous for careless work or slacking, and generally indifferent to improving their ratings.

"Now, let us consider making the cut in Class A," continued the speaker. "Largely upon the efficiency of A employees we have been able to turn out quality goods, maintain sales so far, and keep the plant running. The A fellows earn the highest wages. If we make the cut there, not so many of them will have to be dropped to balance our payroll. And they stand the best chance of finding new jobs elsewhere. More of the B employees would have to go, but not as many as C employees. The C employees would find it hardest to get new jobs outside. If we cut either A or B, however, the quality of our product might fall, and that would mean decreased sales, and probably further lay-offs later on if business doesn't improve. All those in favor of dropping A employees will vote by rising."

Not a single employee rose. Nor did anyone favor dropping class B workers. When the vote was taken on Class C, three-fourths of the employees were in favor of it.

"That is the way we voted in the cabinet," announced the president, "and we are glad to see that you take the same view, after considering all angles of the problem. But in the cabinet we voted unanimously. Does the minority here want to register its vote for some other plan?" Not a single employee rose or made a suggestion.

More and more employees are being given a voice in the employer's policies that affect themselves. Hardly a week goes by without an announcement that some large corporation has adopted such a scheme of employee representation or "industrial democracy." Conservative business men are a little apprehensive about this tendency, interpreting it as an uncalled for and radical concession which may ultimately lead to a demand for employee representation in management-labor interests on the board of directors.

The John Leitch Plan

The most famous plan of the kind is that devised by John Leitch, which is patterned on our democratic system of government, and is designed to restore the man-to-man relation that existed when business conditions were smaller. As his ideal of this relation, Mr. Leitch tells a story of Phil D. Armour. Noticing one of his employees out in the mire of the old stockyards with leaky boots and thin coat, he gave him money to buy a warm, dry outfit, saying that he couldn't afford to have him get sick. That was autocratic business, with the personal relation. Business continued to be autocratic in management when it outgrew the personal relation, and the best remedy for the evils of autocracy is democracy, Leitch maintains. Under his plan, the executives of a business form a cabinet, the department heads and foremen a senate, and employees elect a house of representatives. The senate and house of representatives meet weekly. Any employee who

has a suggestion, grievance or complaint brings it to the representative elected from his department, and it comes before the house. Matters affecting working conditions, hours, wages and the like are formulated in bills, hearings are held, and they become law or are rejected after debate, modification and vote.

At first sight, it might appear as though such concessions by management would turn an organization into a debating, fault-finding, time-wasting, interfering rabble. But actual experience with the Leitch plan in thirty of more diversified business organizations shows that it brings grievances to light, corrects them, decreases soldiering, increases efficiency, lowers production costs and improves quality. Incidentally, there seems to be no place for labor organizations in a business where such a plan is in operation, and thus far there has never been a strike in such a plant.

One of the key men in every organization, with broad possibilities for making trouble as well as avoiding it, is the foreman. Injustice by foremen, and soldiering or carelessness by workmen, can be brought to light under such a plan, investigated publicly, and corrected. One or two investigations of that sort make foremen and workers aware that nothing can be hidden or "put over." The foreman becomes a leader instead of a boss, and his subordinates work under him in a new spirit.

Employers suddenly find themselves closer to employees, looking through their eyes at conditions that had been hidden from them, while employees get broad views of the problems with which the management deals. Yet if an employee democracy were to pass a bill increasing wages or shortening hours to an unreasonable extent, or go beyond lines of conservative management in any other way, the cabinet has power to veto a result under this plan. That working people are generally reasonable, even conservative, is shown in the striking fact that it has never been necessary to use this veto power. Employees find themselves closer to management, facing executive problems, and seeking solutions in their own work. Probably the most typical illustration of this is found in voluntary teamwork to eliminate waste and losses.

A story of the kind constantly cropping up was found recently in a New England textile plant. Some inspectors discovered a lot of stockings which had become slightly soiled, and were classed as "seconds." Peeling off their coats and rolling up their sleeves, they got busy and washed the whole lot, turning them into "firsts."

The worker wants a hearing because he has something to say—a complaint to be taken up or a suggestion of possible value. If no channels are provided for giving him a hearing, he can do one of two things—try to reach the management through an organization which will usually be hostile, or silently quit and find a job elsewhere. If he is given a hearing, and facilities for reaching people higher up at any time, it is not he alone who profits, but management as well. For again and again it has been demonstrated that what the worker has to say about things that affect himself is something that management can seldom afford to be ignorant about. The gain may be great to the fellow who wants to be heard. It will be greater to the fellow who listens.

Power Plant Management

Superheated Steam and Superheaters

By ROBERT JUNE, M. E.

THE possibilities of effecting economies in the power plant through the use of superheated steam are worthy of careful consideration in these days of high fuel and labor costs. In this connection, the fact should be recognized at the outset that the use of superheated steam is not necessarily confined to new plants especially designed for such operation, but that in many cases it can be successfully adapted to old plants without incurring excessive expenditures. In our discussion it will be well to examine the effects of superheating, factors governing advisability of using superheat, temperature to which steam is to be raised, superheater construction, materials for use with superheated steam, and some details of operating practice.

Effects of Superheating

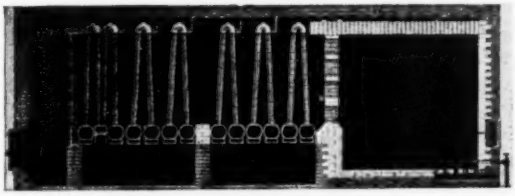
By superheating, we mean the practice of raising the temperature by steam immediately after its generation in the boiler to a point considerably above the saturation point, without greatly increasing its pressure. When utilized in the steam engine, superheated steam possesses the following advantages:

1—The more heat supplied per unit of volume of steam to the engine, the more work can be obtained from the engine, and the increase of pressure having a practical limit, this extra heat is to be obtained by superheating the steam. A moderate amount of superheat produces a large increase in volume, the pressure remaining constant and diminishing the weight of steam per stroke for a given amount of work.

2—The diminished density of the steam employed to do the work lessens the back pressure, or, as commonly expressed, improves the vacuum. This also applies to the air and vapor which are carried with the steam and further expanded by the increased

heat, and are consequently contracted to a much less volume when chilled by striking the cooling surface of the condenser; thus the air pump has less work to do.

3—The prevention of condensation during the expansion without the use of steam jackets is the most important advantage to be attached to the use of



Independent type of superheater

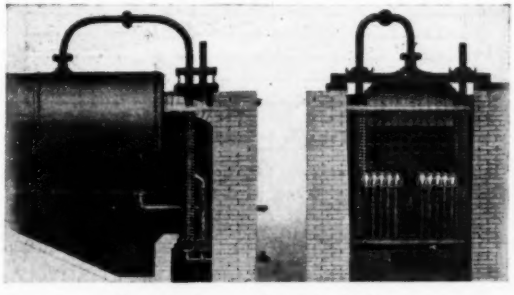
superheated steam. Steam jackets are wasteful and inefficient when applying heat to the engine. Inefficient because the contact is only with the steam immediately adjacent to the wall of the cylinder, with probably little effect being derived by the steam in contact with the piston and in the interior of the cylinder out of reach of the radiation from the walls; wasteful because of the full effect of heating the exhaust steam after it has done its work in the cylinder during the waning stages of expansion and throughout the exhausting stroke. This is particularly true of engines which have a pause at the end of the stroke, which pauses always finds the cylinder full of steam which has completed its work in the cylinder and is ready to be exhausted. Ample evidence of the truth of this statement is found in the ratio of water condensed in the jackets of direct-acting pumping engines to the amount of steam used in the cylinders.

4—Elimination of condensed water in piping leading to engine.

5—Reduction of friction, cutting down loss of pressure in ports and passages, and permitting reduction in size of conducting pipes.

Factors Governing Advisability of Using Superheated Steam

The decision to use or not to use superheated steam in any particular plant will depend upon a thorough

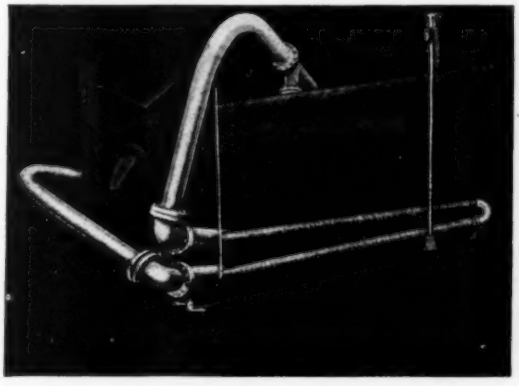


Superheaters on fire tube boilers

study of the plant conditions, taking into account fuel cost, engine performance, capacity of plant, steam line losses, cost to install and maintain superheaters, etc.

Engine Performance. As a general proposition, the savings to be effected from the use of superheated steam vary inversely with regard to the efficiency of the prime mover when using superheated steam—being greatest with direct-acting pumps, and smallest with steam turbines. A fair estimate of the average saving which may be effected with moderate superheat, that is, say 100 to 125 degrees F., based on continuous operation of existing plants, is for slow-running, full-stroke, throttling engines, including direct-acting pumps, 40 per cent; simple engines, noncondensing, with medium piston speed, including compound direct-acting pumps, 20 per cent; for compound condensing Corliss engines, 10 per cent; for triple expansion engines and turbines, 6 per cent. Of course higher figures than these have been obtained, but these may be taken as a fair average. Table 1 below gives a fairly accurate range and steam consumption for prime movers, based on saturated steam 100 degrees and superheated 200 degrees.

Capacity of Plant. Naturally the capacity of the plant has an important bearing upon the advisability



Superheaters on horizontal water tube boilers

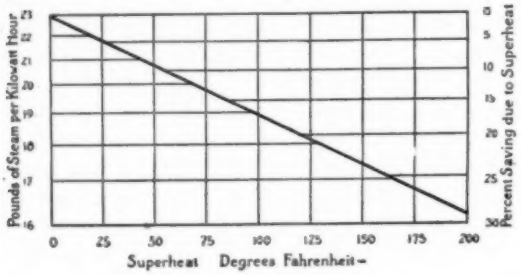
of using superheated steam, inasmuch as the cost of the installation may be out of proportion to the savings to be effected. If the steam consumption is equivalent to about 250 hp. continuously, however, it would seem desirable to investigate the possibilities of superheated steam.

If the plant is large, the question should, by all means, be taken under advisement. This is particularly true where there is any apparent lack of boiler capacity, as it may develop that the use of superheated steam will necessitate the purchase of additional boilers.

Another point worth remembering in this connection is that in the case of old boilers where the insurance companies may require that, owing to their condition, they be operated at lower pressures. Under such circumstances, a loss in capacity of the boiler results. The loss may be made up by a change from saturated to superheated steam.

Steam Line Losses

Condensation in long pipe lines is a problem which is faced in many plants. Ninety per cent of the heat necessary to evaporate water is latent heat, and if condensation takes place before the steam is transformed, this latent heat is liberated and the waste and losses due to condensation may be large. Under best conditions, with properly proportioned, well-covered steam pipes, we find a loss of one-fifth to one-third of a degree F. of superheat per foot of steam pipe. It seems reasonable to assume that with



Saving due to superheat-test of high speed triple expansion engine. 100 deg. superheat reduces steam consumption per kw. hour from 23 lbs. to 18.8 lbs., saving 17 percent.

the ordinary large and indifferently covered steam pipe that the loss may reach as much as one degree F. for every foot of pipe; consequently, a pipe 100 feet long would probably lose 100 degrees of superheat, which is equivalent to 5 per cent of moisture in the steam, if we assume that the steam is dry before leaving the boiler.

Superheat is necessary to raise the temperature of the steam to a point where it may all be transmitted to its destination without continuous loss. As superheated steam does not give up its heat as readily as saturated steam, it can be transmitted with smaller total loss. Superheated steam is, therefore, valuable as a means of eliminating the condensation in steam pipes.

The cost of installing superheaters should be figured to include not only the cost of equipment, but also the cost of remodeling the steam lines should this be necessary. Superheated steam will, of course, cause greater expansion and contraction in the steam lines, and it may be necessary to make important changes in these lines before superheated steam can be used.

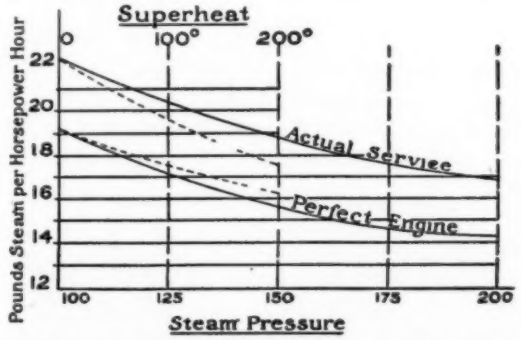
Insofar as maintenance is concerned, if the superheater is installed in the boiler it can be regarded as a part of the boiler, and there is no reason why this maintenance should be higher than that of the boiler with respect to the comparative cost of the two installations. If pipe lines are not properly arranged they may be more expensive to maintain, but the remedy for this is proper arrangement to take care of the expansion and contraction. Once this has been secured there is no reason why piping for superheated steam should cost more than that for saturated steam.

Degree of Superheat. In the United States and Canada total steam temperatures rarely exceed 600 degrees, while in Europe 600 degrees is a common temperature, and temperatures of 850 degrees are often reached. This does not necessarily mean that steam practice in Europe is in advance of steam practice in America and Canada. In Europe they have had a condition of excessively high fuel costs and low labor costs, whereas we have had the reverse, that is, comparatively cheap fuel and very high costs for labor and materials. This means that, in so far as we are concerned, the greatly increased cost of an installation above a total temperature of 600 degrees F., may so far offset the possible savings in fuel that the installation will not be economical.

As a general proposition, we may state that for at least 95 per cent of the steam plants in the United States and Canada 100 degrees of superheated steam is about right, and that only in exceptional cases should superheat exceed 125 degrees.

It should be remembered that high temperatures are apt to interfere with lubrication, and perhaps to cause warping of the valves. With superheat, difficulties of this nature are to be expected. While on this subject of the effect of superheated steam on the valves of an engine, it may be well to run over conditions obtaining in the engine when superheated steam is used. After leaving the superheater and while passing through the steam lines, the heat lost by radiation does not cause condensation, but, instead, merely causes a loss of a portion of the superheat.

The greatest saving from superheat is obtained in the engine cylinder and results from the elimination of most, if not all, of the loss due to cylinder condensation. The saturated steam losses ordinarily



Effect of increasing superheat (dotted lines) to perfect engine and actual service.

occur in the cylinder, due to condensation caused by the steam coming in contact with the relatively cool cylinder walls. The drop in pressure, caused by this condensation, induces a further flow of steam into the cylinder to fill the space originally occupied by the steam which has been condensed. In the average

simple engine cylinder, condensation varies from 20 to 40 per cent and as water of condensation takes up 1/150 as much space as the steam, we may assume that the same amount of steam will be required to replace that which has been condensed. Even with superheated steam we do not always obtain dry steam at cut-off, but the important point is that most of the losses caused by cylinder condensation are eliminated. The presence of moisture in steam is apt to result in the use of large amounts of oil lubricating purposes and water in the steam tending to wash all water out of the oil. With superheated steam the walls of the engine cylinder are free from water; a thin film of oil adhering to the surface will give perfect lubrication.

Superheater Construction

Superheaters are of two general types—those placed independently of the boiler, and those built into the boiler and at some point heated by the gases from the boiler furnaces. With water-tube boilers, it is usual to place superheaters between the first and second passes, although this arrangement varies with the individual boiler. With fire-tube boilers, the superheater is placed in the combusion chamber at the rear of the boiler.

Since the absorption of the heat depends upon the average differences between the gases and the steam, the required degree of superheat may be obtained from a comparatively small amount of heating surface close to the furnace, or a larger amount at a greater distance.

The requirements of a successful superheater are:

1—Safety of operation and minimum danger of overheating.
2—Construction permitting of free expansion.
3—Arrangement such that it may be cut out without interfering with plant operation.
4—Provision for keeping surfaces exposed to gases free of soot.

Advantages of the independent superheaters are:

1—Degree of superheat is not dependent upon boiler performance.
2—Repairs may be made with our reference to the boilers.

Among the disadvantages are:

1—Requires individual attention.
2—Requires extra piping.
3—Requires additional space.

Among the advantages of the superheater place in the boiler setting:

1—Lower first cost.
2—Requires no individual attention.
3—Takes up no additional space.

Among the disadvantages are:

1—Subject to boiler conditions and most frequently to be watched during the period of cutting in boilers, and superheat is apt to fluctuate with temperatures in the furnace.

A great deal has been written about the advantages and disadvantages of certain types of superheater construction. At the present time there are a number of superheaters on the market which have been brought up to a high state of perfection, and there is no need here to enter into a discussion of their relative merits. The commercial superheater companies and large manufacturers of superheaters have conmpetent engineers who specialize in superheater work, and the power plant manager or superintendent contemplating a superheater installation will do well to consult with these specialists.

Materials for Use for Superheated Steam

Where boiler pressures are high and a comparatively high degree of heat is used, it is necessary to pay special attention to the materials and construction of the piping system. The following points are worthy of note in this connection:

Piping. Screw joints are not generally desirable with superheated steam. This makes necessary the use of welded flange, Van Stone or similar joints. For this work piping made from open-hearth steel is more desirable than ordinary wrought iron piping, because it can be properly worked since it contains less carbon, and the quality is more uniform.

Fittings. Fittings are now manufactured especially for superheated steam, and for this purpose are entirely satisfactory. A point to be watched is that the fittings as purchased from the manufacturers are specified as being intended for use with superheated steam. Of course, as a matter of good practice, it is well to limit the number of fittings as much as possible by the use of welded joints and bends in the pipe.

Valves. The very best valve obtainable should be used for superheated steam. There is a general impression among the engineers that globe valves and angle valves are more apt to prove steam dry after a period of use than gate valves, although the gate valve has the advantage of causing a much smaller drop in pressure, due to its design permitting a straight flow of steam. A piece of steel six inches long when heated to 500 degrees F. will expand .019 inches. This fact shows the variations in the coefficient of expansion of the metals of which they are constructed will have an important effect on the performance of a valve setting tight. So valve setting is a point which should be watched.

Metals. Various authorities state that cast iron should not be used at temperatures which they variously state as ranging from 480 to 575 degrees F. Above this temperature, the limit of elasticity in cast iron is reached with a pressure ranging from 150 to 175 lbs. Under such conditions the material is strained and does not resume its former shape, eventually showing surface cracks which continue to grow until the metal parts. From this it follows that iron castings are not suitable for either fittings or

valves in superheated steam work. Cast steel is, undoubtedly, the best material for both valves and fittings. This metal is capable of withstanding all temperatures and pressures up to at least 800 degrees F., without showing any appreciable weakness.

High temperatures have a very pronounced effect upon the breaking strength of brass and bronze, and these materials should not be used with superheated steam, as they will soon get out of shape and eventually break.

Gaskets. Copper or bronze gaskets are looked askance upon by many engineers for superheated steam work. Among types which met with favor are corrugated soft Swedish steel gaskets and corrugated copper or bronze gaskets surrounding asbestos.

Operating Notes

There are times when, in the ordinary use of superheater, the circulation of steam will be less than at others. While at such times superheaters may be exposed to the furnace gases at high temperature, such a condition occurs when the load is temporarily arrested or when cutting in the boilers to guard against damage. Under such conditions some superheaters are provided with flooding arrangements by which superheater types are filled with water and thus made part of the evaporating surface of the boiler. To do this, it is necessary to open and close certain valves on each boiler, an operation which must be reversed when the critical period is over and the superheaters are to resume their normal practice.

Admitting water to the interior of the superheater induces a formation of scale in the tubes. Moreover, a superheater which has been flooded must be drained before being put back into service. This necessitates on each boiler a double operation on the part of the attendant which must be carried out with great care and intelligence because of the disastrous results to the engine which might follow if the water in the superheater were driven into the steam pipes. This danger of flooding is one which has been so well recognized that superheater manufacturers are getting away from it by protecting their superheaters by means of heavier or special construction so that they will not burn during these special periods.

Even superheaters which are not flooded should be equipped with a drain so that they may always be blown out. On starting a boiler that has been cooled, the drain should be opened and kept open until steam appears. This will blow out the water that may have condensed in the tubes when the boiler cooled.

Another thing that should be carefully watched in all boiler plants is setting of the superheater safety valves. These should always be set to "pop" first. When this is done, if the plant loses its load for any reason, there will always be a flow of steam through the superheater.

TABLE 1
Ranges in Steam Consumption by Prime Movers

Type Engine	Steam Consumption, ——1 lb. per HP. hr.—— Steam Saturated	Superheat 100 deg.	Superheat 200 deg.
Simple non-condensing	29- 45	20- 38	18-35
Simple non-condensing automatic.	26- 40	18- 34	16-30
Simple non-condensing Corliss....	26- 35	18- 30	
Compound non-condensing	19- 28	15- 25	13-22
Compound condensing	12- 32	10- 20	9-17
Simple duplex steam pumps.....	120-300	80-160	
Turbines non-condens'g (kw. hr.).	28- 60	24- 54	21-48
Turbines condensing (kw. hr.)....	12- 42	10- 38	9-34

Fundamental Chemistry in Paper Making

Paper Read Before the Technical Section of the Paper Makers' Association of Great Britain and Ireland on September 21, 1921, in Edinburg, Scotland

Part I—The Present Position of Chemistry in Paper Making

WHAT part does chemistry play in the paper industry today? Is there a field for fundamental chemical research, or is there none? It is true that chemistry is doing much for paper-making, but it is no less true to say that the industry is a realm largely unexplored by the chemist, mostly for lack of incentive or opportunity. It is only natural in an industry that that side of it which is of obvious importance should receive the greater part of the attention of the manufacturer. In paper-making, the principal process being the formation of the web, it is only to be expected that the lion's share of thought and energy should be devoted to development of the engineering or physical side of the industry. This is just and right, but it is altogether unfortunate that the latent possibilities of other sciences should have been overlooked as they undoubtedly have been.

The view is commonly taken that the practical application of chemistry is limited to those cases in which the products are the final result of a series of more or less well-defined chemical reactions. But this is far from being the case. In practically all industries chemical knowledge is of value for purposes of control, and it is probably the case that the causes underlying the majority of the troubles, giving rise to customers' complaints, can be traced in most industries to a "chemical" origin.

There are many directions in which chemistry is of obvious importance in the paper mill. For example, the benefits which result from a knowledge of the "chemical quality" of incoming raw materials as ascertained by analysis are probably so well known as to require little comment. The production

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of caustic soda and resin size involve processes of chemical change, and even the preparation of alum, bleaching powder and dyestuff solutions lose nothing from the attentions of a chemist.

The digestion of rags and esparto, and the bleaching of these and other fibers are chemical processes which have received a considerable amount of attention from the mill chemist, but most of the investigation has been of a directly technical kind, and little progress has been made towards advancement of our knowledge of the ultimate mechanism of the changes which are involved. Up to the present time it has apparently not been worth while to investigate these processes more closely, probably because a sufficiently good result is got without difficulty or much attention to detail. Day by day it is becoming forced upon us more and more clearly that we are an insular people and depend for our very existence upon our export trade. Competition is rapidly increasing in our foreign markets, and it therefore becomes more and more important that no avenue which may lead to the production of cheaper or better quality goods should be left unexplored. I suggest that the paper-maker again give his careful consideration to the advisability or otherwise, of instituting further scientific inquiry into the many unsolved and controversial problems of digestion and bleaching.

Chemistry recognizes two principal types of matter. Matter which cannot be split up into anything simpler except by chemical agency it regards as a compound. Typical examples of such compounds are cane sugar and common salt. On the other hand, two or more "compounds" may be so intimately mixed together as to present all the external characteristics and qualities of a pure simple compound, but yet such material may be separated into its constituent compounds by physical means. Such matter is described as a "mixture." Compounds are built up up of atoms of two or more different kinds, the proportion in which the several kinds appear being quite definite for each particular compound. One of the most important functions of chemistry is to ascertain what atoms are present in a compound, and how they are linked up together one to another, since it is these two conditions which largely control the chemical behavior of the compounded substance.

A very common method of chemical inquiry is therefore to ascertain what is known as the "constitution" of the substances involved. By the knowledge so obtained the chemist is often able to exert better control over the chemical activity of the substance and to produce better yields, purer substances and new products.

For these reasons it is not a little surprising that there has been so little organized attempt to elucidate some of the many problems of paper-making on a "constitutional" basis. It stands to reason that unless the manufacturer knows something about the chemical structure of the compounds he has to handle, he must be to some extent handicapped in carrying out the methods of his process. Such investigations relating to the atomic structure or constitution of materials are typical examples of fundamental research, and in them we have a field of inquiry holding much promise of profit for the investigator.

The basis of a sheet of paper is a film of innumerable vegetable fibers; many kinds of fibers are used and we are content to include them all in the comprehensive terms "cellulose"; it is recognized that different fibers possess different paper-making properties, but we have no very clear idea why this should be so. Here, then, surely we have an outstanding example of a case where investigation into the constitutional character of the different celluloses should prove of prime importance. Consideration of the import and production figures only serves to emphasize this view. In 1919 over 1,000,000 tons of crude fiber were imported in various forms, which it is calculated represented at least 600,000 tons of "cellulose." The unofficial estimate of the Paper-makers' Association of the pre-war productions of paper in Great Britain and Ireland is 1,092,000 tons a year, which means that, roughly, 750,000 tons of cellulose are put through the paper-making process annually. Clearly it should be worth while to know something more about the chemical constitution of the celluloses.

The Fundamental Chemistry of Cellulose

It not infrequently happens that the chemist inquiring into the constitution of a compound finds it more convenient to turn his attention to derivations of the parent substance in the first instance. Knowledge may often thus be gained which is sufficient to enable the investigator to surmount obstacles which previously barred his direct attack of the problem. Information upon the chemical nature of derivatives of the celluloses is therefore also likely to prove of no little value to the paper-maker, in spite of the contention that the basis of paper is cellulose and not its derivatives. Such knowledge must particularly appeal to the esparto paper-maker, because the first step of his process is the removal of the non-fibrous elements of the raw material by a somewhat drastic chemical treatment. It is commonly accepted that if the appropriate amount of caustic soda be used, a sharp separation of the non-fibrous portion by a process of solution takes place, leaving the true fibrous cellulose unattacked. Let us see what light the present state of our knowledge of the chemical constitution of cellulose throws upon this problem.

A considerable number of years ago Ost and other chemists formulated the opinion that cotton cellulose consisted of a condensed aggregate of grape sugar (glucose) molecules. This conclusion was hardly justified by the experimental evidence available, and the question has recently been reopened by Irvine, who has succeeded in preparing a large proportion of glucose (85 per cent theoretical on above

assumption) from cellulose with full proof of its identity (as glucose). This work received further confirmation no later than last month (Williams). Esparto cellulose differs in several respects from cotton cellulose, a noteworthy feature being that it is not nearly so inert towards chemical change, but there are reasons for believing that glucose or some closely related sugar forms a constituent part of the molecule. It is therefore of some interest to notice the behavior of sugars towards alkalis such as caustic soda, as it is not unlikely that any reaction between the two may have considerable bearing upon the removal of the non-fibrous materials of esparto grass by caustic digestion. The reaction between alkalis and sugars is a most remarkable one, but it is of so complex a character that I can make no attempt to describe it here. Let it suffice to say that in a long series of fundamental researches spread over his whole life Nef demonstrated that if caustic soda be allowed to react with any one sugar, profound changes take place, and so deep seated is the reaction that more than two hundred different chemical compounds are produced. This is indeed a startling result and makes it clear that a most careful watch requires to be kept upon the alkaline digestion of all cellulose fibers. In point of fact, we know that celluloses are profoundly modified by the action of alkalis, but it is far from being appreciated in the industry that, not only may serious losses of cellulose take place from this cause, but also that the modified cellulose so formed may produce effects which persist even in the finished sheet. Further information of the precise effect of alkalis upon cellulose can only be obtained by carefully guided fundamental research, but it is to be devoutly hoped that results may be obtained in a shorter period of time than has been required to establish our present knowledge.

A further problem of paramount interest to the esparto paper-maker is the utilization of the 50 per cent so-called "non-cellulose" matter present in the grass.

Today we are content to look upon this as a necessary evil, and in some cases to make use of it to preheat the lye for evaporation or to generate steam. But it seems a pity in a country like our own, which is rich in coal, to use a material which we have taken the trouble to bring all the way from Africa merely as a fuel. Many attempts have been made to extract useful products from this material, but none have proved altogether successful. In the discussion on a paper recently read by Raitt in London on the subject of bamboo paper-making in India, Sindall raised the question of Rinman's patented method of treating the soda lyes, which apparently aroused some interest. By this method the lyes are concentrated and finally heated in presence of lime, whereby acetone, methyl alcohol and methyl-ethyl-ketone are produced and distilled over. These are valuable products, and, if obtained in sufficient quantity, might make the process a practical one. I do not think, however, that the problem will be satisfactorily solved so far as esparto lyes are concerned until such fundamental work has been done upon the chemical character and constitution of the bodies composing the "non-cellulose" portion of the "complex"—esparto grass. Once the chemical identity of these components has been proved, then we shall be ready to go ahead with the recovery of useful by-products on sound scientific and practical lines.

I trust I have produced sufficient evidence to justify my contention that the prosecution of fundamental chemical research merits the early attention of the paper-maker. Germany, the United States of America, Canada and Japan are working tooth and nail to develop the scientific side of paper-making; it is going to be a race for the markets of the world and the winner must inevitably be the vendor at the lowest price and of the highest quality.

Part II—A Note on the Chemistry of the Beating Process

The reactions which take place in the beating engine are conveniently considered under four headings—firstly, the separation of the fibers by the action of the roll, whereby felting quality is obtained; secondly, the cutting of the fibers to the required length, again by action of the roll; thirdly, the incorporation of water with the fiber, which produces "wetness" or hydration; and, lastly, the treatment of the fiber with resin soaps and dyestuffs, by which means sizing and coloring of the web are effected.

The first three of these reactions are commonly regarded as the result of the mechanical action of the roll and are therefore deemed physical processes, while the fourth is usually considered to depend upon the colloidal character of cellulose and therefore to be within the domain of colloidal physics. It is notable that chemistry as such is not held to play any very important part in beating reactions.

If we trace the development of the beating process proper, apart from sizing and dyeing, we find that progress has been in direct proportion to development, in beater design at all events, within recent years. As a result, we have many excellent types of highly efficient beaters to choose from, but at the same time we have made comparatively little progress in our conception of "cause and effect" in the beating process.

It therefore appears to be of interest to consider some recent fundamental work and to examine what influence it may have upon our ideas of beating.

In the short space of time available it is not possible to attempt a review of recent inquiry, and I have, in consequence, selected two lines of investigation which well serve (1) to draw attention to the possible value of fundamental research, and (2) as a

reminder that beating problems are not necessarily confined to the mechanical sciences.

The first case to which I wish to refer has reference to the mechanism of the sizing process. All paper-makers at some time or another encounter mysterious sizing difficulties; either the sheet suddenly becomes too hard, or, what is more usual, the hardness no less suddenly drops away, and nothing that is done seems to have any beneficial effect. I do not propose to enter into a discussion of the underlying mechanism of the sizing reaction, but I believe all will agree that it is far from being properly understood. With regard to methods, each paper-maker has his own preference, but, on the whole, today acid sizes seem to be the most popular. That is to say, sizes which contain a relatively larger proportion of free resin are in a majority. The recent work of Dr. Sieber, of Kramfors ("Zellstoff und Papier," 1921, p. 15) is of special interest, since this investigator has reopened the problem by a study of the behavior of colloidal suspensions of pure resin, particularly with regard to the effect upon them of aluminum sulphate (paper-maker's "alum"). The details of the work can be obtained from the original accounts, but, briefly put, the experimenter examined the effects of the addition of the aluminum sulphate in increasing amounts upon the resin suspension after the lapse of a certain period of time. Dr. Sieber finds that the addition of very small amounts of aluminum sulphate produces no effect; as the quantity added is increased, complete precipitation of the resin occurs, but, on further increasing the quantity of aluminum sulphate added, no effect is produced, while, on still further increasing the amount of alum, complete precipitation again takes place. The author puts forward one explanation which at least serves as a working hypothesis. The author also examines the effect of the salts which commonly produce hardness in water with somewhat similar results, and as the result of experiments conducted to determine the effect of several salts jointly, the conclusion is reached that hard waters may produce precipitation without the quantity of each individual salt present exceeding the minimum (critical) value. On the other hand, he finds that a suspension of pure free resin is stable to even very hard water, which is not the case with the ordinary resin "milks" as used in the paper mill. From further considerations the author argues that the object of the paper-maker should be to obtain the largest possible surface area in the free resin portion of his size, which means that the smaller the particles of precipitated resin are, the harder will the sizing be. Experiments were also carried out to determine how resin is affected by cellulosic fibers. Although not directly conclusive, absorption appeared to take place on the boundary surface of the fiber, but the interesting fact appears that the storage of free resin on the fiber does not give the fiber any ink-resisting properties.

Experimental work is apparently still in progress, and one looks forward with interest to the further results which Dr. Sieber may obtain. In the meantime it is too early to attempt any criticism, but it does not seem too much to hope that this fundamental research will lead to results which may do much to clear away the uncertainty and ignorance which still surrounds the engine-sizing process.

Hydrocellulose and Oxycellulose

The second instance to which I wish to draw attention concerns our third subdivision of the beating process, namely, the production of "hydration" or wetness.

The view is usually held that hydration is the outcome of the combination of the cellulose with water as the direct result of the mechanical bruising action of the roll. It is well known that certain types of colloidal substance possess the power to take up water in semi-combination to a remarkable degree, and as applied to the beating problem in question such a hypothesis offers a convenient explanation of the production of wetness.

Of considerable interest in this connection are the investigations of Schwalbe. Professor Schwalbe has carried out a long series of researches extending over many years upon the decomposition product of celluloses (particularly wood-cellulose). His results lead him to the conclusion that it is not the cellulose as such which is the direct cause of "wetness," but that products formed by the chemical decomposition of cellulose are the reactive bodies in the production of hydration. This investigator concludes that hydrocellulose and oxycellulose are chiefly concerned in the process, and he seems to incline to the view that the latter is all-important, since he has taken out a German patent (D. R. P. 1920, 303,305) for the production of wet stock, the basis of which is the formation of oxycellulose by chemical agency prior to the beating proper; by this means he achieves very rapid hydration.

It is important to note that the chemical constitution of hydrocellulose and of oxycellulose is unknown, and also that their relationships one to another and to the parent cellulose are not properly understood. Professor Schwalbe realizing the importance of gaining information upon these points, has undertaken further fundamental inquiry into this problem, and his published results are of considerable interest.

We may also note that on the other side of the Atlantic the hydration problem is also receiving attention. In U. S. A. Seibert and Minor, as the result of their researches upon chemical reactions in the beater, have also reached the conclusion that a substance which they designate "hydrocellulose" is the real medium by which hydration is effected.

We have, therefore, to face the fact that two independent authorities have both reached the same con-

clusions—firstly, that hydration of cellulose is not the simple combination of the cellulose with water which is usually assumed, and, secondly, that the effect of the mechanical bruising action of the roll is to produce profound chemical changes of a somewhat unexpected character.

It is too early to attempt useful criticism of this view, but it would appear that in the near future not only may we have to modify seriously our views of the beating process, but that the distinct possibility exists that we may before long have radically to alter our beating practice.

The important point about these investigations, upon which I wish to lay special emphasis, is that they are essentially the outcome of fundamental experimental research. Much further work of the same character requires to be done before technical results can be expected, but the interesting fact is patent that fundamental chemical research may find application in a totally unexpected direction.

Germany, the United States and Canada are actively prosecuting chemical inquiry into paper-making problems.

If the British paper industry is to maintain its place in the world's markets, it would appear unwise to neglect this avenue to progress.

Another Concrete Failure

By HERBERT CANTWELL

At paper and pulp mills, isolated as they are, it is necessary to have a knowledge of the fundamentals in engineering, and particularly in reinforced concrete, about which there is still much to be learned, and so this article is believed to be of great interest and very timely.—EDITOR.

WE are continually hearing of failures in concrete structures due to what "AFTER THE ACCIDENT INVESTIGATORS" call "POOR DESIGN," or a design fundamentally INADEQUATE IN STRENGTH, but the real reason may be more truly stated to be either ignorance or gross negligence on the part of the designer.

In the last issue of the Engineering News-Record, for September 15th, we see a long article entitled "Form Settlement Causes Concrete Building Collapse." This was the Masonic Temple in Salina, Kansas, and the report states that not only the proposed completed building but the temporary falsework was deficient and fundamentally inadequate in strength. This is the most recent example of incompetent architects successfully blinding a gullible committee as to their ability and knowledge of the theory of design, and to thereby secure the contract to design and erect an important structure which has failed to stand up.

Other examples may be cited as follows:

In the Engineering News-Record, December 27, 1906, there is an account of a reinforced concrete girder bridge which collapsed under a traction engine after it was in service for some time.

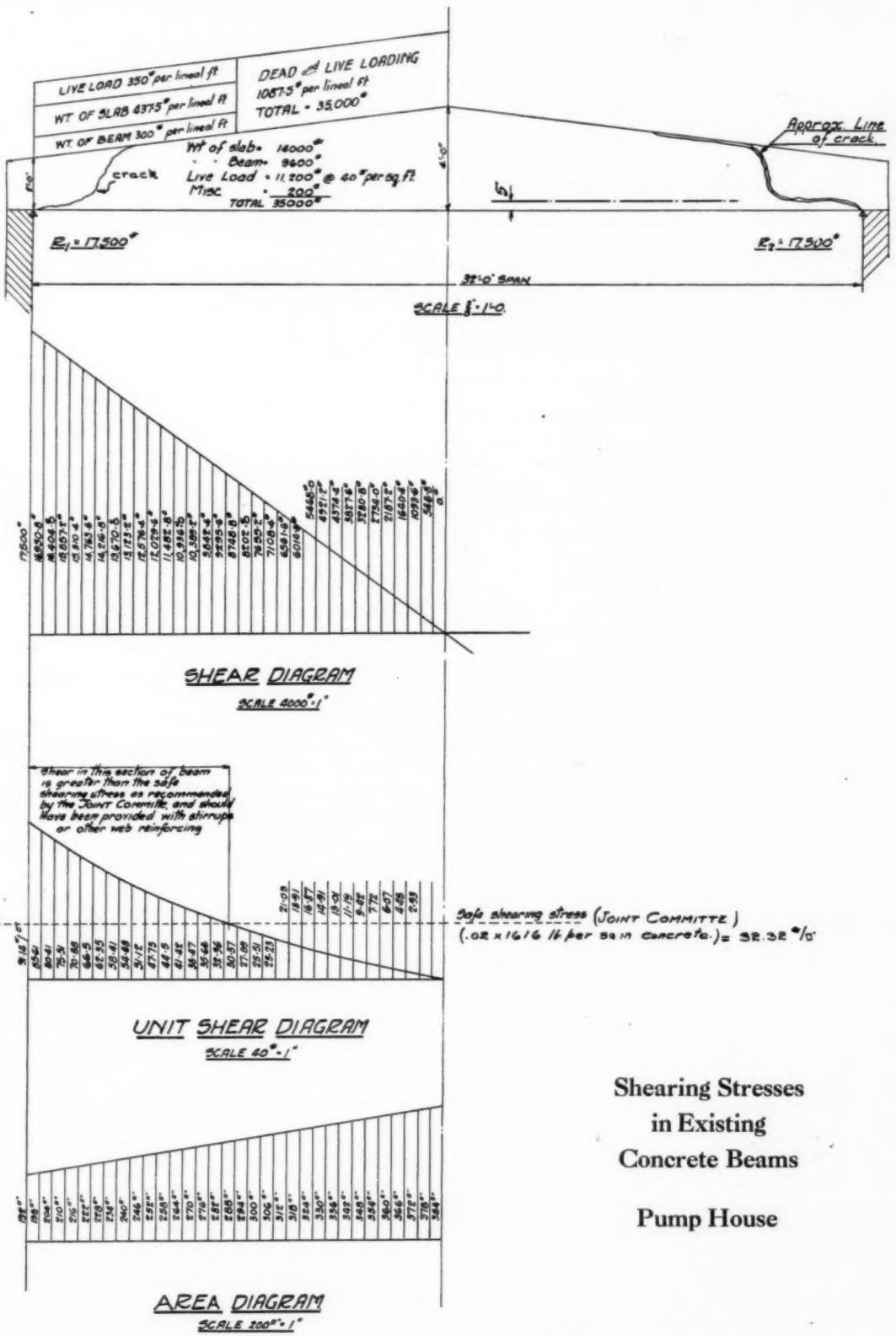
In the Engineering News-Record, April 23, 1908, there is an account of a reinforced concrete girder bridge which collapsed in the night with no load upon it, two years after it was built.

Both of these bridges were said to have been failures due to original weakness in design, and both of these bridges had short shear members.

In the Engineering News-Record of August 18th there is a report of a collapse of a reinforced concrete ceiling in the Marlborough-Blenheim Hotel at Atlantic City. The cause of this failure was said to be the rusting of steel. However, Mr. Edward Godfrey has stated that the steel in this structure was stressed up to 100,000 lbs. per square inch, and that the concrete was being asked to take tension, which, as we all know, is contrary to established practice, and he makes the statement that "The marvel is that it did not collapse many years ago."

I am showing you herewith another glaring example of what we may call, for politeness sake, "Poor Design," made by a firm of industrial engineers in New York City. On the drawing attached herewith is shown one of the typical roof beams which failed. This beam was built to support the roof of a pump house, and the lines of failure are as shown on each side of the beam. These beams were spaced 8 feet 9 inches centre to centre. The length of beam was 32 feet. The height of beam varies from 2 feet to 4 feet high by 8 inches wide. The steel allowed was 2—1⅛ inch longitudinal straight bars placed at a distance of 5 inches up from the bottom of beam. This to carry a total loading of 35,000 lbs. I have shown in a table under the sketch, a total shear diagram, an area diagram, and also a unit shear diagram. From stresses due to moment, we find at once that the steel is being asked to take 21,400 lbs. per square inch with the concrete at 975 lbs. per square inch, which is excessive, and good engineering practice would have called for stirrups or other web reinforcing where the shear exceeds 32 lbs. as shown in the sketch.

Is it therefore to be wondered, in viewing the above from the designers point of view, why these beams did not fail long ago? What actually occurred is that the failure started along the cracks on the ends of the beam, as shown, and the actual failure may be explained by the following facts:


LIVE LOAD 350# per lineal ft
WT. OF SLAB 437.5# per lineal ft
WT. OF BEAM 300# per lineal ft
DEAD and LIVE LOADING
1087.5# per lineal ft
TOTAL - 35,000#
Approx. Line of crack
crack
Wt of slab = 14000#
" Beam = 9600#
Live Load = 11,200# @ 40# per sq. ft
Misc = 200#
TOTAL 35000#
R1 = 17,500#
R2 = 17,500#
32'-0" SPAN
SCALE 1/8" = 1'-0"
SHEAR DIAGRAM
SCALE 4000# = 1"
Shear in this section of beam is greater than the safe shearing stress as recommended by the Joint Committe, and should have been provided with stirrups or other web reinforcing
Safe shearing stress (Joint Committe)
(.02 x 1616 lb per sq in concrete) = 32.32 #/□"
UNIT SHEAR DIAGRAM
SCALE 40# = 1"
AREA DIAGRAM
SCALE 200# = 1"

Shearing Stresses in Existing Concrete Beams

Pump House

1st.—The beam was poured monolithically with the concrete side walls, and there was therefore a tendency for cantilever action, and further, the tops of the beams at the ends were in tension with a negative bending moment, as is the case in continuous beams.

2nd.—Further, the steel was placed at a distance of 5 INCHES above the bottom of the beam, which is not good engineering practice. Reference is made to the progress report of the joint committee on standard specifications for concrete and reinforced concrete, as submitted to constituent organizations on June 4, 1921.

Paragraph 67 reads in part as follows:

"Metal reinforcement in fire-resistive constructions shall be protected by not less than 1 inch of concrete inslabs and walls, and not less than 2 INCHES in beams, girders, and columns, provided aggregate showing an expansion not greater than that of limestone or trap rock is used."

It is clearly evident that since the BOTTOM SIDE of the beam is in TENSION, therefore the steel should be as NEAR the bottom as possible in order to take the tension, as good engineering practice does not allow ANY TENSION to be taken up by CONCRETE, and the only reason why we embed the steel in the concrete for two inches is for fire protective purposes.

3rd.—It is further clearly evident that in the present case, FIVE INCHES from bottom of beam to steel is entirely too much, and we have therefore the CONCRETE IN TENSION all along the bottom of these roof beams.

4th.—Finally, the HIGH SHEAR and DIAGONAL TENSION STRESSES which set up in this beam near the ends were NOT PROPERLY TAKEN CARE OF BY SHEAR REINFORCEMENT and we have therefore failure in the beams along the lines of structural weakness as the natural and logical result.

Managers' and Foremen's Responsibilities

By ROY J. MURBACH

The Gardner-Harvey Company, Middletown, O.

Address delivered at the Paper and Pulp Section, Tenth Annual Safety Congress of the National Safety Council, Boston, Mass., September 26-30, 1921

IN DEALING with this subject one must bear in mind that good management of plants means better safety records, therefore, I will speak mostly of the management's relation to his employes.

The day of personal contact is a thing of the past in the majority of plants. Formerly, when plants were small and a manager ruled one or two hundred men, he was personally acquainted with every man in his establishment and they understood him. In those days, if the men had any grievances, they could have a talk with the "Old Man," as managers were then called, to settle their troubles. Today, conditions have changed. The manager no longer has time to encourage the workmen with a greeting or a handshake. Instead he very often hands the workmen a printed notice; there is therefore no personal touch between the two. It is, however, far from possible for a manager to cater to the interests of each individual or settle all grievances among his men and still keep his mill running. Even should he try it, he would soon find the day far too short to accomplish all his work. At the same time the men who were not given consideration would soon feel that partiality was being shown by the management. For this reason, it has become necessary to divide the men into groups in all large plants, placing one man who is directly responsible to the manager in charge of each group. I have taken the word "Foreman" to designate these men, although this term includes superintendents, master mechanics, chief engineers, etc. I will ask you to bear in mind that throughout this paper "Foreman" refers to the men who must report directly to the manager, and by the managers, I mean the men who are directly responsible to the president for the operation of the plant. As I said before, plants are too large for the manager to know all the men personally, but they are not too large for him to know all of his "Foremen" and for him to be responsible for the kind of "Foremen" in his employment.

Managers should be men who have minds of their own, and be capable of aiding in the making of decisions by the foremen. If he is a man who is easily influenced by "smooth" talk, the chances are that some of the foremen will take advantage of him. This will lead to hard feelings among the "Foremen." Therefore, several important items for him to consider are: First, to sincerely endeavor to give his foremen a "square deal"; second, to treat them as partners in the business; third, to give much thought and energy to their training because he must rely upon them to such an extent.

Selecting a New Foreman

When a manager promotes a man from the ranks or employs a new foreman, he should call a meeting of all the foremen. At the meeting, he should introduce the new man, stating his position and ask all of the foremen to co-operate with him in helping the new man to get acquainted with the conditions of the plant. The manager should outline the work for the

new man and explain fully what is expected of him. If the foreman is employed from another mill, it should not be taken for granted that he knows his job. Regardless of the kind of work and the similarity, there are no two plants in which the conditions are the same, and it takes a new man several days to become acclimated to the new surroundings. If he has the assistance and co-operation of the manager and other foremen, the work will be much easier and he will soon feel at home. When selecting a man for a vacancy, it is always more desirable to advance a man from the ranks when at all possible, because he is thoroughly familiar with the methods used, is in harmony with the spirit of the mill, and his promotion is an encouragement to his fellow workmen.

Let us now discuss the kind of manager who feels himself superior to his foremen. The chances are when he employs a new man he will make him feel his position at their first conference. He will not be introduced to his fellow foremen, and the feeling of good fellowship which should be obtained is not created. Instead of co-operation with the new man the men often play a joke on him when he asks for some information about the mill, or else they will take the attitude that the new man is "butting in" and they will give him the "cold shoulder." I dare say, that under such management there will always be discord among the men and the foremen have the "I don't care" attitude.

If the manager chooses careless foremen, he cannot expect to operate his plant on a safe and efficient basis. I would say that the manager is directly responsible for the safe and efficient operation of his plant, because he has charge of the choosing of men for the head of his various departments. This is not an easy task, for foremen should be placed wisely in regard to safety as well as skill. It may be that a man may be better qualified to handle electrical hazards or chemical, etc. This should be taken into consideration, unless the organization is so arranged that the safety engineer is responsible instead of individual foremen. All hiring of men who are to work in the different departments should be left to the employment bureau of the foreman, as the case may be. A manager should not give a friend of his a job without first discussing the matter with the employment bureau and the foreman under whom this man is to work. Nor should the applicant ever know that it was the manager who obtained the job for him. Because in such cases a man very often does not take orders from his foreman seriously, or else takes his time to carry them out.

Meetings for Discussion

Every plant should have an auditorium or some available meeting place for managers and foremen. Meetings should be held at least once every month with the honest intention of the manager to give his foremen a "square deal." At these meetings, subjects of operation, safety and new problems should be discussed. Experiences, statistics and reports should be compared. This gives the foreman pride, credit for work well done and furnishes a stimulant for better results, and perhaps a higher goal at which to aim. This place for meetings should not be for foremen alone; it should also be for the representatives of the great mass of working men. What the working men really want is self-expression, and they should have the right to discuss and share in the adjustment of matters affecting their own interests —thus the solution will come by itself. In most cases a mass meeting of all the men would not be possible or practical, but it is possible for the men of each department to choose a committee of their best men to meet with a committee of the management to discuss subjects which take deliberation.

Should Be Sociable

A large field in which the manager can show true interest in his foremen and workmen is the social field. Not many years ago this was practically unheard of, but today it has become one of the essential developments of all plants. Under the social field there are many phases to be considered, as for example, group insurance, recreation and amusements, the housing situation, health of employes and their families, lunch rooms, rest rooms, groceries with minimum prices, charity for the absolutely needy, etc. Every manager should make a study of the conditions surrounding his men and their families, and sincerely endeavor to obtain all he possibly can for them.

Now then, let us take the foremen's relationship to the plant. As has been said before, this includes all men who are directly under the supervision of the manager.

A good "Foreman" possesses a pleasing personality, and is not a "grouch." He should be a leader of men, and not a driver, for the days of driving men are past. An amiable man can get more co-operation from his men than the one who would be termed a "bully." It used to take a husky man to be a foreman, but today it takes a quick-witted man who can understand human nature, who treats every man as an individual and does not regard human labor as something which can be bought and sold as machines and raw material. The foreman should be well enough acquainted with his men to be able to call them by their first names. An employe usually feels nearer to you, if you can call him by his first name or his "nick-name." A distinction should, however, be made between friendliness and familiarity on the part of the foremen. The responsibility of his men's work rests upon the foreman, consequently he must be responsible for their actions. When a foreman takes on a new man, he should call all the men of his department together and introduce the newcomer to them and then explain just what is expected of him,—the working hours, etc. The next step would be to take

the new man through the mill, to point out to him the dangerous places and then allow him to work with another man who is thoroughly familiar with the plant for a few days. Thus the liability of accidents would be reduced.

Foreman's Duty Toward Safety

Safety has to do with the safeguarding of human lives. No phase of the foremen's work is so important as this. The foreman should be made to feel that he is a protector of human life, that he can prevent men from being maimed and crippled, and that his mistakes are apt to be sad ones. He should be kind-hearted and patient, and quick to see things which endanger life and limb. It is also the duty of the foreman to make material conditions so safe that the workmen can do their tasks without abnormal care. After the new man has started working, the foreman should study him carefully to see if he is fitted for the place and to learn whether he is reliable, or a careless, shiftless workman. As I stated before, the foreman has the responsibility of selecting his men, this should be the case in every mill, although they have an employment bureau which hires and "fires" his men. In no plant should the foreman be compelled to take a man sent him by the employment bureau against his wishes, although the candidate might be a good man, in some cases it would be impossible for him and the foreman to agree. If a foreman does not act in harmony with one of his men, he should report the fact to the employment bureau that the said man may be transferred to another department. Good work cannot be expected where there is discord. This discord may be between only one man and the foreman, but if allowed to continue, soon spreads throughout the department. This will cause the men to think less of their foreman as a leader because they will see the dissatisfied one "getting by," while doing less and poorer work.

The foreman should study human nature or the psychology of human nature, that he will be better able to handle each man individually. Some men require a command in order to accomplish certain duties, while the willingness of others must be secured in a different manner. Then, too, there are cases of reprimanding which must be considered when men make mistakes or "loaf on the job." Some men need speaking to rather "roughly," while with others it is sufficient just to remind them of the fact that they have made a mistake or are wasting time.

A foreman should always be glad to explain the best way of doing work to his men. If the men are unfamiliar with the work, he should show them that he is not afraid to work, but should always allow the workmen to solve problems for themselves. He should always be open to suggestions from his men and always encourage self-expression, because there are many capable men under the foreman whose suggestions might prove valuable because they are in the thickest of every day battles, where suggestions naturally arise of which the foreman would never think.

The foreman should not boast to his men of what he has accomplished and how he once did things, nor should be take all the credit for the efficient and safe operation of his department, or neglect to mention the name of the man who made a worthy suggestion when reporting to the manager. A good foreman will show by some reward, a good word or a slap on the back that he appreciates good work.

I have only touched on some of the points of the subject for I feel that much more could be said. It summarizes down to the fact that the right kind of a man is necessary to assume all of the responsibilities of a manager or foreman. Of course the manager is responsible to the president for the proper and efficient operation of the plant. When you speak of the operation of the plant, you speak of the responsibility of every person working in the plant and the machinery.

The foreman is directly responsible to the manager for the safe and efficient operation of his department. His responsibilities are of a smaller scope because he has fewer persons and less machines under him, but his task is more difficult because he has to deal with less intelligent labor.

Head of the Stock Back of the Slice

H. LHOMME and M. ARGY

Translated from LAPAPETERIE XLIII, 445 (May 25, 1921)
By A. Papineau Couture

ON all paper machines the device for distributing the stock on to the wire consists essentially of a flow box, into which the stock from the machine chests is fed either at the top or at the bottom, an apron (usually of rubber) which joins the flow box to the wire, and one, two or three slices which dam up the stock and under which the latter finally flows on to the wire. The first slices serve the purpose of giving a more regular flow and also of holding back the scum and foam, which remains at the surface.

It is well known that with machine made papers the strength in the machine direction is greater than in the cross direction, while the elongation is greater in the cross direction. But with hand-made papers, except for irregularities in manufacture, the

strength and elongation are the same in all directions. This is due to the fact that when paper is made on the machine the fibers tend to follow the direction of flow of the water that carries them, that is, to lie parallel to the direction of the wire.

In the manufacture of paper by hand, the workman dips his mold into the vat of pulp and allows the water to drain through the wire of itself, merely aiding the felting of the fibers by a slight motion of the mold: the stock may thus be considered to reach the wire without any velocity. The ideal to be striven for in making paper on the machine is then to try to have the stock come on to the wire with a zero velocity. The motion imparted to the mold by the workman is fairly well imitated on the machine by the shake. As to the velocity, what is really required, is that the *relative velocity* of the stock and wire be equal to zero; in other words, the velocity of the stock as it passes under the last slice should be equal to that of the wire.

The head of stock back of the last slice required to give the desired speed is easily calculated from the well-known formula $v=\sqrt{2gh}$ (1) in which v is the velocity of the stock, h the height of stock behind the slice, and g is the acceleration due to gravity, viz., 9.81 meters per second.

From (1) we get: $v^2=2gh$ and $h=\frac{v^2}{2g}$

The following table gives the value of h in meters for various speeds, ranging from 5 to 300 meters a minute (1 meter=39.37 inches). In other words, when the wire is traveling at any speed indicated in column (1), if the height of stock be equal to the corresponding value in column (4), the relative velocity of the two when the stock comes on to the wire will be zero.

(1)	(2)	(3)	(4)
v, in meters per minute	v, in meters per second	v^2	$h=\frac{v^2}{2g}$ in meters
5	0.083	0.007	0.00035
10	0.167	0.028	0.0015
15	0.250	0.062	0.003
20	0.334	0.111	0.006
25	0.417	0.174	0.008
30	0.500	0.250	0.013
40	0.667	0.445	0.023
50	0.833	0.695	0.035
60	1.000	1.000	0.051
70	1.170	1.360	0.070
80	1.334	1.780	0.091
90	1.500	2.250	0.115
100	1.656	2.780	0.142
120	2.000	4.000	0.204
150	2.500	6.250	0.319
180	3.000	9.000	0.459
200	3.333	11.120	0.567
250	4.170	17.400	0.886
300	5.000	25.000	1.275

It is evident that the machine can be run with a height of stock different from that given in the table. The height of the bottom of the slice above the wire must also be considered. But then the optimum conditions for a proper felting of the fibers are not obtained.

The amount of stock flowing on to the wire can be easily obtained from the weight of the untrimmed paper turned out and the consistency of the stock. The required opening between the slice and the wire is then found by dividing the rate of flow of the slush pulp by its velocity, by the width of the wire, and by the coefficient of contraction.

Take, for instance, a speed of 300 meters a minute (which is the talk of the day), or 5 meters a second, for newsprint weighing 45 grams per square meter, with stock at a consistency of 0.5%. For a width of 1 meter we have a rate of flow of stock equal to $\frac{45\times100\times5}{0.5}=45{,}000$ grams, or 45 liters.

As the speed is 5 meters, or 50 decimeters, a second, the cross sectional area of the orifice must be $\frac{45}{50}=0.9$ square decimeter, and the height, for a width of 1 meter, or 10 decimeters, will be $\frac{0.9}{10}=0.09$ decimeter, or 9 millimeters. This must be divided by the coefficient of contraction, which in the present instance is about 0.65 (case of discharge from a narrow standard orifice the bottom of which is continued by a plane surface, which is the apron) so that the actual height of the opening in this case will be $\frac{9}{0.65}=13.8$ millimeters, which value is perfectly admissible.

In practice, to obtain the required zero relative velocity between the stock and the wire it would be sufficient to adjust the height of the slice above the wire so as to get the required head of stock and the proper weight of paper.

This reasoning naturally leads, for high rates of travel of the wire, to a greater head of stock than we have been accustomed to, but which is by no means impossible. Someone who has seen a high speed American machine running at over 300 meters a minute informs us that a very high head is used behind the slice, of the same order as that given in the above table.

It would require practical experiments on the paper machine to determine if such a high head of stock really had the influence which we expect on the formation of the sheet and on the relation between the strength in the machine and cross directions. With

the moderate speeds at which the machines are run in most of the French mills, the head required is not greater than the height of most of the slices, and such tests would not interfere with the regular production of the machine. If the difference in strength of the paper in the two directions was eliminated, or even reduced, it would be well worth while, especially for work where the "grain" of the paper is of importance, such as pasting, making ledgers, working cigarette papers, etc.

Silicate of Soda in Papermaking

By JAMES G. VAIL

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Paper prepared for presentation at the joint fall meeting of the Technical Association and Superintendents' Association, October, 1921.

SILICATE of soda is a material which finds application in a great many branches of industry. Probably no heavy chemical has a wider range of uses. In its diversified applications it has touched the experience of almost every one. Most papermakers are aware that it is used in the manufacture of paper and that it is added to the beater and precipitated with alum in the same manner as rosin size is precipitated, but only a small number know definitely the properties which its use imparts to paper. Some confusion is found also as to the respective functions of silicate of soda and rosin size in paper. Rosin size is necessary to give water resistance, but as has been pointed out by Klemm[1] and others resistance to printers' ink is produced with silicate of soda. A good deal of work has been done in the laboratory to show the nature of the precipitate which is formed from silicate of soda and the conditions under which this precipitate separates from the water in the beater and is retained among the fibers of the paper, modifying the character of the finished sheet.

The observations which are to be here reported are based also on practical experience on large quantities of paper. These have led to a better understanding of the behavior of silicate of soda in the beater and on the paper machine and have given a basis for better judgment of the conditions for its successful use.

Nature of Sodium Silicate

Before considering details of handling silicate of soda, it is necessary to make plain what we mean by this term. Silicate of soda is not the name of a definite salt but rather the general name for an indefinite number of products composed of silica and soda in varying proportions. Different ratios of silica and soda, along with different concentrations of the solutions, give varying properties, both chemical and physical. It is this ability to modify the properties of silicate of soda which accounts for its great variety of uses. Adhesives, plastic cements, quick setting cements, sizings, gels, water softeners, detergents, paints and cements for digester lining are all included in its scope of usefulness. As drawn from the furnace, silicate of soda looks like glass. Like glass the proportions of its ingredients may be varied within wide limits without much change in appearance. It differs from glass in that it may be dissolved in water. It comes upon the market in concentrated solutions. Much misunderstanding of results harks back to the assumption that silicate of soda is a definite thing and many published articles report results which it is impossible to confirm or disprove without knowing just what grade of silicate of soda was used. Because two samples of silicate of soda look alike it does not follow that they are alike. Solutions ranging from 34 to 54 percent total solids may have identical viscosity. The body of silicate is no index to the amount of solids present. To avoid confusion, all manufacturers have established certain brands which represent definite compositions of silicate.

Alum Used to Precipitate It

To precipitate silicate of soda in paper stock the soda is neutralized with alum. Hence, a silicate with the smallest possible amount of soda should be chosen for reasons of economy. The lowest alkalinity which is practical from a commercial viewpoint is represented by a solution containing 7 percent total alkali as Na_2O and a ratio of soda to silica approximating 1 to 4. A product of lower relative alkalinity is too nearly insoluble to be of commercial use. Failure completely to neutralize the soda will result in an imperfect precipitation on the one hand and injury to the rosin sizing of the paper on the other. A silicate of 1 to 2 ratio requires twice as much alum to produce a given effect on the paper.

A solution of the 1 to 4 ratio is a jelly at 37° Bé corresponding to 34 percent total solids. When this is diluted to the concentration corresponding to that which obtains in the beater and a solution of alum is slowly added, the solution becomes more and more turbid until it becomes acid in reaction and a precipitate separates from the solution. Other precipitating agents, such as nitre cake, calcium sulphate or even hard water, will precipitate silicate of soda and when these are used the amount of alum added for the silicate can be proportionately reduced. This is a

[1]Klemm, Mineralische Leimung von Druckpapier. *Wochbl. Papierfabr.*, 1907, no. 25, p. 1983.

large factor in some mills. The precipitate is very bulky and light and readily becomes entangled with the fibers, assisting in their retention on the wire and cementing them together. If an insufficient amount of alum be added, no precipitation will occur and without precipitation the advantage of using silicate is lost. It is, therefore, of first importance to see that a sufficient amount of alum is used to give an acid reaction. The precipitate contains the elements of an aluminum silicate. It probably contains along with the aluminum silicate both aluminum hydroxide and hydrated silica. Silicate of soda thus differs from rosin size, which begins to precipitate when the first small quantity of alum is added.

Texture Depends on Dilution

The texture of a silicate precipitate depends on the dilution of the silicate and the alum. Under the conditions occurring in the beater a light flocculent product, well adapted to harden and increase the strength of the paper, is produced, but if the chemicals were mixed in a relatively concentrated condition the material thrown out would be granular, sandy or lumpy, just as would be the case if dry alum were mixed with a strong solution of rosin size. When the light flocculent precipitate is dried, it hardens to a horny consistence, too hard to be easily crushed by the hand. In this hard condition, it still retains a considerable amount of water, which contributes largely to its toughness. The apparently dry precipitate always contains at least 25 percent of water under the conditions of drying paper.

Retention Affected by Concentration

The effects of retaining this material in the substance of paper is shown first of all by an increase in the ash of the paper. A study, involving 550 tons of paper and an examination of 1,200 samples gave an average of 1 percent in ash with an average addition of 3.48 percent liquid silicate based on dry fiber. The amount of dry alum necessary for the precipitation of the silicate was 25 percent of the weight of the silicate solution. The average retention was 66 percent of the total silica in the silicate, plus the Al_2O_3 of the alum. There is good reason to suppose that the use of larger proportions of silicate, as reported by Blasweiler[2], would not only produce more marked effects on the paper but would be accompanied by a higher percentage retention. Amounts as high as 10 percent of the dry fiber will make the stock appreciably slower on the wire but this effect was not observed at 5 percent of below.

Strength and Ink Tests of Paper

The hardness and the finish of the paper were determined by the combined judgment of several experienced papermakers, as we know of no method of reducing these qualities to a numerical standard. From comparison of sheets, which differed only by the silicate content and the alum requisite for its precipitation, the statement is warranted that the use of silicate in every case produced a harder and a smoother sheet. The Mullen tests of the papers in this series when averaged show a gain of 12 percent in favor of the papers containing silicate. Ink resistance was studied in four different grades of paper by the floating method with standard ink. In three of these grades the papers containing silicate showed better ink resistance than those which contained none. This may be attributed to the increased retention of rosin in the paper, there being no reason to believe that sodium silicate can of itself increase the resistance of paper to water or to an aqueous ink.

In studying the effect of the addition of silicate to the beater, it was observed that the increment of ash increased over a period of several hours, sometimes reaching its maximum as late as seven hours after stock containing silicate came on the machine. This is interpreted to mean that a larger precipitation of the silicate and better retention develops as the white waters from which the silicate has been precipitated are returned to the machine and to the beaters.

How Colors Are Affected

Silicate, like rosin size, should be handled in such a way that its alkalinity does not affect adversely the colors used in the paper. Where the silicate is added first and is completely precipitated with alum before the addition of the color no interference with the color has ever been experienced, but it is not safe to add the necessary quantity of alum and then a color sensitive to alkali before the silicate, because when the silicate is added it is certain to be for a short time locally in excess, and the full strength of some coloring materials is not restored by the alum. Owing to better retention some papers show an improvement in color when silicate is used and when handled with proper regard to its alkaline character satisfactory coloring is always practicable in papers containing silicate.

From the point of view of maximum retention, the experiments point to the following order of additions to the beater as the most satisfactory:

1—Silicate.
2—Alum for the silicate.
3—Rosin size.
4—Clay or other fillers.
5—Alum for the rosin size.

Many variations are possible without destroying the effect of the silicate, this being simply the preferred practice.

Papers Treated with Silicate

The grades of paper which have been considered in careful tests include cover, envelope, papeterie, book, writing, kraft, tissue and box board. It would not be reasonable to say that silicate of soda should be used in every mill or even in every mill that requires the properties in paper which the use of sili-

[2] *Papierfabrikant*, 1921, 33, p. 875.

cate tends to impart, but it has been found possible in some cases to make a paper of acceptable quality with a less expensive furnish and in other cases to secure a grade of hardness and finish not otherwise obtainable. In mills where the trim from combining machines using silicate as an adhesive is furnished to the beaters the resulting paper may be improved by precipitating the silicate with alum. Silicate of soda is always helpful in bristol boards, because of the cementing action on the fibers which tend to stand up as a fuzz or beard on the surface. This characteristic is also very useful in certain furnishes for wrapping paper and the cheaper grades of writing. All paper that is judged by its rattle and snap can be improved by the judicious use of silicate.

Silicate-Starch Good Sizing Agent

As pointed out by Wrede[3], papers intended for printing may be sized with silicate of soda or with soda and starch in such a way as to provide all the qualities required in printing and with the added advantage that they are not subject to discoloration on long exposure to light, as are all papers which have been sized with rosin size. Printing ink is an oily substance and it is possible to produce a paper which gives perfect satisfaction in offset printing without showing much resistance to water. The more general recognition of a distinction between water resistance and oil resistance will do much to extend the usefulness of silicate of soda in the paper industry.

Silicate of soda is a cheap commodity available in unlimited quantities. It is sterile and odorless and remains so. It is manufactured in a variety of grades, but under precise control, so that a result once secured need not be in jeopardy owing to variations in the composition. The addition which it makes to the paper is not susceptible to the influence of light. It helps to retain and cement short fibers in the sheet. Its properties should be investigated in connection with every paper in which hardness and smoothness of finish is an asset. To summarize:

Silicate of soda as it appears in commerce is of a number of different types.

The correct type for the paper industry has a ratio of alkali Na_2O to silica SiO_2 approximating 1 : 4.

It is precipitated by alum and produces hardness and snap, smoother finish and usually a small gain in strength.

Printing papers may be made with silicate without the use of rosin, and other papers can be improved by using silicate and rosin size together. Silicate properly applied does not interfere with color. It remains colorless on exposure to light.

It is available and cheap. Practical experimentation is needed to secure its benefits.

[3]Wrede, *Wochbl. Papierfabr.*, 1913, 10, p. 835.

The Newsprint Situation

By R. S. KELLOGG
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Address Before the Second Semi-Annual Meeting of the Salesmen's Association of the Paper Industry, on November 1, 1921, at the Drake Hotel, Chicago

POSSIBLY it will be a little helpful to us in getting an idea of the newsprint situation if I sketch some of the general features before I touch upon the specific question of the influence of overseas paper.

When we speak about the newsprint industry, we always speak about it in this country at least in an international sense, that is, a North American sense, because the newsprint industry is not an industry in the United States alone; it is an industry in the United States and Canada combined, very largely produced by common capital and very largely going to common markets. So we have to regard it as a North American industry and not particularly a United States industry.

I have recently been doing some checking up to see what the capacity of that industry is in North America, and I find that since February, 1920, there have been added to the North American newsprint industry, new machines having a capacity of a thousand tons of newsprint daily when run at the speeds for which they are designed, which is a pretty heavy addition in capacity. The present rated capacity of the newsprint industry is approximately 8,500 tons daily, about 5,000 tons in the United States and nearly 3,500 tons in Canada. Were all these machines to run at ninety-five per cent of their rated capacity for three hundred days, or a working year, they would produce approximately 2,400,000 tons of newsprint paper, and 2,400,000 was the quantity produced in the United States and Canada in the year 1920, but that included probably 80,000 tons made by machines that ordinarily are not operated upon newsprint—the so-called marginal machines that run on newsprint when it pays and run on wrapping paper and other things when they pay better. So we have today in North America a capacity of 2,400,000 tons a year of print, providing these machines ran for three hundred days at ninety-five per cent capacity, which is pretty high operating capacity. That is about the situation we have reached, as far as we can see, and probably is the maximum capacity of the

newsprint industry in North America for several years to come.

This addition of a thousand tons a day in less than two years has been plenty. Anybody who is familiar with the newsprint industry knows that there is no particular inducement today to present newsprint manufacturers or prospective newsprint manufacturers to put in more new mcahines. For some little time to come, I think we are up as high in producing capacity in North America as we are likely to get.

Some Comparative Figures

We always have to use measuring sticks, and the favorite measuring stick that most of us can grasp is what we are doing this year compared with what we did last year or some other year. So far, and by so far I mean the first nine months of 1921, we have produced in the United States and Canada, seventeen per cent less newsprint paper than was produced in the first nine months of 1920, and judging by tendencies our total production of newsprint paper in the year 1921 will be close to 2,000,000 tons, possibly a little over that, and 2,000,000 tons was the approximate production of the industry in the years 1917 and 1918, or, in other words, we have produced materially less than we did in the years 1919 and 1920. As I said, so far this year it has been seventeen per cent less, and nine months of the year furnish a pretty fair measuring stick for what the probable twelve month's production will be.

On the other hand, there has not been a decrease in newsprint consumption in any such proportion as there has been in production. That is a question that I want to give you a few more statistics upon. I was very much surprised when we got the figures together yesterday, to find out that the decrease in total consumption of standard newsprint in the United States so far this year has been only four per cent from the consumption in the first nine months of 1920, and that is a very much better figure than once upon a time I anticipated. I thought last spring that newsprint consumption this year might run possibly ten per cent less than it did last year, but the actual fact is that for the first nine months of this year the consumption of standard newsprint paper, so far as we can determine and we can determine it fairly well, has been only four per cent less than it was in the first nine months of 1920, and 1920 was the biggest consumption ever seen. That is upon the shipments from the mills in the United States, adding to the imports, subtracting the exports, which have been almost nothing, and then taking into consideration the increase and decrease in publishers' stocks. That figure checks in very closely with the remark Mr. Lichtenstein made about the small percentage of any commodity required to swing a market. We know what happened starting in the fall of 1919 and running into about this time last year in the newsprint market. It was a run-away market and the publishers were all hollering that there wasn't paper enough being produced, and when we wound up the year of 1920 we found there had been an increase of ten per cent in production over the previous year and an increase of only five per cent in consumption. The run-away year of 1920 was caused by an increase of five per cent in consumption over the previous year and a general scare that there was not going to be enough. What has happened this year has been brought about by a decrease of four per cent in consumption; or, in other words, there is no question at all that four or five per cent excess or under supply of a commodity will bear or bull a market at any time. I think this is very clearly demonstrated and we ought to try to keep our heads and not get too much scared by some of the things that we read and some of the things that people try to make us believe, because, after all, the total change has not been large.

Imports from Overseas

The imports of overseas newsprint paper during the past twelve months have been, in round numbers, 120,000 tons, and 120,000 tons, as you see, amounts to exactly five per cent of our possible 2,400,000 tons yearly capacity here, so that the imports of overseas paper in the past twelve months have been only five per cent of the producing capacity of the industry here today. That is all it has amounted to. There has been a tremendous hullabaloo about it, and there is no question but what it has had a very damaging effect, but that is all it comes to in the last analysis.

Of that five per cent, or 120,000 tons that has come in during the past twelve months, only forty per cent has come from Germany. We were told by publishers' agents a year ago, for instance, who had been abroad for the purpose of contracting for foreign paper and coming back here and telling us about it and trying to bear our market in consequence, that Germany could send us 100,000 tons a year, or ever 10,000 tons a month of newsprint paper, but she has not sent half that. That shows again that we should not always believe all we are told.

The balance of the 120,000 tons has come chiefly from Sweden and Norway and Finland. We have also had pretty fairly heavy importations of pulp, both ground wood and sulphite, but the importations of ground wood into the United States for the past twelve months from overseas have been only about 48,000 tons. The importations of sulphite from overseas in the past twelve months have been in the neighborhood of 100,000 tons, and those are rather small proportions of our capacity to produce ground wood and sulphite here.

The total amount of newsprint paper that has come in from Germany in the past twelve months has been only two per cent of the producing capacity of North America. But it is this continual offering of the German paper at prices below any possible cost of production in this country, that has been making the trouble. The offers have been spread broadcast

throughout the United States, and publishers and publishers' agents claim that for the last two months they have had a standing offer of 10,000 tons a month of German paper at two and a half cents a pound, laid down in New York. I don't know that anybody has bought it, but that has been going and going and going and rolling up like a snowball. If Germany chooses, she can put paper over here at $40 a ton and still not lose any money on it. The point of that is that it should not be paid too much attention to. If somebody wants to go and buy it, let him buy it and get his fill of it, because there is no possibility of any manufacturer in the United States and Canada meeting a price that can be made under these conditions.

I checked up with some first-hand information that I got from Berlin a few days ago for the period ending September 30th, and the domestic price in Germany of news grade of sulphite, and that is a price fixed by the German pulp manufacturers through their association, because they have associations that fix prices and enforce them, for the period ending September 30th was 310 marks per hundred kilos. A kilo is two and two-tenths pounds. At the present time a German mark is worth about six-tenths of a cent in our money. The price fixed on ground wood at the same time was 200 marks per hundred kilos. Translated into the equivalent of our money today, that meant a price for sulphite of approximately $17 per ton and a price for ground wood of approximately $11 per ton. So that if the German newsprint manufacturer takes his sulphite at an equivalent of $17 per ton and his ground wood at an equivalent of $11 per ton and makes it into paper with labor that costs about the equivalent of one-tenth of what our paper making labor is paid, you can see what the possibility is of competing in an overseas market with him. It simply can't be done.

Freight Rates

Added to that situation is the freight. I have been getting together some information upon freight rates, and it shows up rather interestingly. Bob Houk knows, for instance, that if they wish to ship paper from Espanola down to New York, it will cost them $10.50 for a 2,000 pound ton. If they wish to ship it to Philadelphia, it will cost them $11.60, but if the importer wishes to bring paper from Hamburg to New York, he can bring it for $3.64 a ton, and he is bringing it to Philadelphia and Baltimore and Boston for the same price. If they wish to ship paper from Glens Falls to New York, a little more than the distance from Albany to New York, it will cost $3.60 a ton for newsprint, or almost $2.00 more than to bring it from Hamburg to New York. That is one of the things that the industry has to face.

We have seen a great many statements put out by the publishers in the last two years about the perfectly wonderful things that are going to happen when they build up the great industry of making paper in Alaska, and how all the East is going to be supplied from the unlimited forests of Alaska. As every one knows, there has been no paper made and shipped out of Alaska, so we haven't a freight rate from there, but no publisher seems to know that if we go to British Columbia mills and bring paper through the Panama Canal to the East coast it costs $17 a ton to do it, and even if we go to the mills near Portland, Oregon and bring the paper around to our East coast, it costs $15 a ton. People seem to have overlooked little details of that character which give a salesman something to do when he goes out and tries to land an order.

Another thing that rather interests our West coast friends is the fact that Scandinavian paper is being taken to the California coast at from $6.00 to $7.00 per ton freight rate, where if they wish to ship it from the Oregon producing mills to the Southern California Coast, it costs them $11.00 to $12.00 a ton. That is the sort of thing we are up against.

There is no cure for this overseas situation immediately. I don't see any hope of any immediate cure at all. The most that can be done about it, it appears to me, is to disregard it just so far as is humanely possible. It may be that in four or five or six or eight months, if there is a new and permanent tariff law (and that is something Congress is in no hurry about enacting because they don't know how to write a tariff law in Washington today), it may hit commodities that are sold in this country on a ridiculously depreciated exchange, but that is not immediately. The only other cure for the situation is for conditions in Euprope to improve so that they will somewhere near get their exchanges up toward normal and to somewhere near begin to consume over there a larger proportion of their own production. That is something also that is not coming very fast.

Decreased European Consumption

One of the most illuminating reports that we have on the European situation is the report recently made by the committee of the Chamber of Commerce of the United States that has just returned from an extensive study of conditions abroad, and they sum it up this way: they say there are no dependable figures to measure the great decline in consumption, but European economists whose opinions are highly regarded declare that the consumption of 300,000,000 people in Europe has been reduced on the average to almost thirty per cent of what it was previous to the war. There is a decreased standard of living, and until that standard of living comes back somewhere to the place it held before, those countries will not consume as large a portion of their own production as they did before. So there is nothing immediately cheerful or reassuring so far as the European situation is concerned. It is one of the things that we have got with us and apparently that we shall have to endure for a time and hope for the best.

It seems to me that there is not going to be any very tremendous quantity of that paper to come to this country. I feel pretty sure of that, and about all that can be done about it is to disregard it and stand it as best we can.

Now when we turn around to look at our purely domestic situation, if it is possible for us to do it, forgetting the European situation, we find a good many reasons for feeling fairly cheerful. I think so without any question. I think that every one can see that so far as the situation in the United States is concerned today, general business has passed through the deepest portion of its troubles and that we are beginning slowly to climb the upgrade toward a better situation. Every business barometer that we can place any reliance on justifies that statement, and the paper industry is going to get the benefit of that improvement.

Newspaper Advertising and Circulation

So far as newsprint particularly is concerned, as I pointed out, we have had a decrease of only four per cent in consumption so far this year over the highest consumption we ever knew before. Newsprint, as you all know, is an article of particularly stable consumption after all. We use newsprint paper every day, just as we use sugar and salt and those things. We have been educated to it and we are going to continue to do it. It is probably true that sixty per cent of all the newsprint paper that is used is used to carry advertising and not news. There is more newsprint, unquestionably, used to carry advertising in newspapers than there is to give news to readers, and the advertising situation is not bad. The total decrease in the newspaper advertising in the twenty-five biggest cities of the United States so far this year has been only eleven per cent from the volume of advertising last year, which was far and away the greatest ever known. So far this year, the volume of newspaper advertising in those cities has totaled six per cent more than it was in 1919, and I think when we wind up the year we will find the total in the large cities this year is equal at least to what it was in 1919, and probably not over twelve or thirteen per cent under what it was in the boom year of 1920.

The situation is not bad in respect to newspaper circulation. Newspaper circulation so far as we can determine is being carried at approximately the same level as it was a year ago. There has probably been not very much decrease in it. In a general way there are a great many cheerful factors that we are justified in placing some credence in with respect to the newsprint market.

As I said at my own meeting in New York last Friday, I don't ordinarily make predictions; I don't believe it is the function of a trade association secretary to make predictions, and the fewer he makes the better off he is going to be. But, after all, looking toward next year, I do feel pretty well assured that we are going to see more newsprint used next year than has been used this year. I believe we have sound facts upon which to base that kind of a statement, and I do feel also that during the next twelve months there will be less overseas paper brought in to the United States than there has been in the last twelve months. I am willing to have somebody come around twelve months from now and check me up and find out how far wrong I am. I do feel that we have a basis for that kind of optimism, at least a fairly reasonable optimism, and for a feeling that while there are no boom times at all ahead, we are headed toward a period of pretty good consumption at a pretty fair price so far as we can tell, if we can ever work out from under the big wood piles a good many of the mills have hanging over them.

The Two Boards

There once lived a man, who eventually died and went to his reward. He left his fond and loving wife two very beautiful bequests—a washboard and a Ouija board. Much practice on the former endowed her with such a degree of skill as to enable her to have a little extra time in which to operate the latter. She also acquired a slight stoop, and a plethora of "that tired feeling." However, after an evening's session at the Ouija board she felt greatly strengthened for the next day's work on the washboard—especially if her "Dear Henry" had communicated to her his happiness at being "where he was at." And the bits of gossip with which he regaled her concerning the doings of the departed "greats" made life worth living—to hear more of it.

"Dear Henry" reported that he was getting the first degree, and that so far nothing had been found against him, and the leader of the Celestial Choir had told him that he undoubtedly would be given a place among the first tenors. The dear wife also learned that Henry was being measured for a halo of the first class, and that a wing specialist was going to call and show him some of the new spring models. She was much comforted to be informed that the dear departed was deriving much joy from sliding down the Golden Stairs.

Then one night she received a frantic message that Henry had been found out, and that he had been told to get out and stay out. He had asked where he "should" go to, and had been told where he "could" go to. He went there. Then he warned his devoted spouse not to try to communicate with him again unless she wrapped the Ouija board in asbestos.

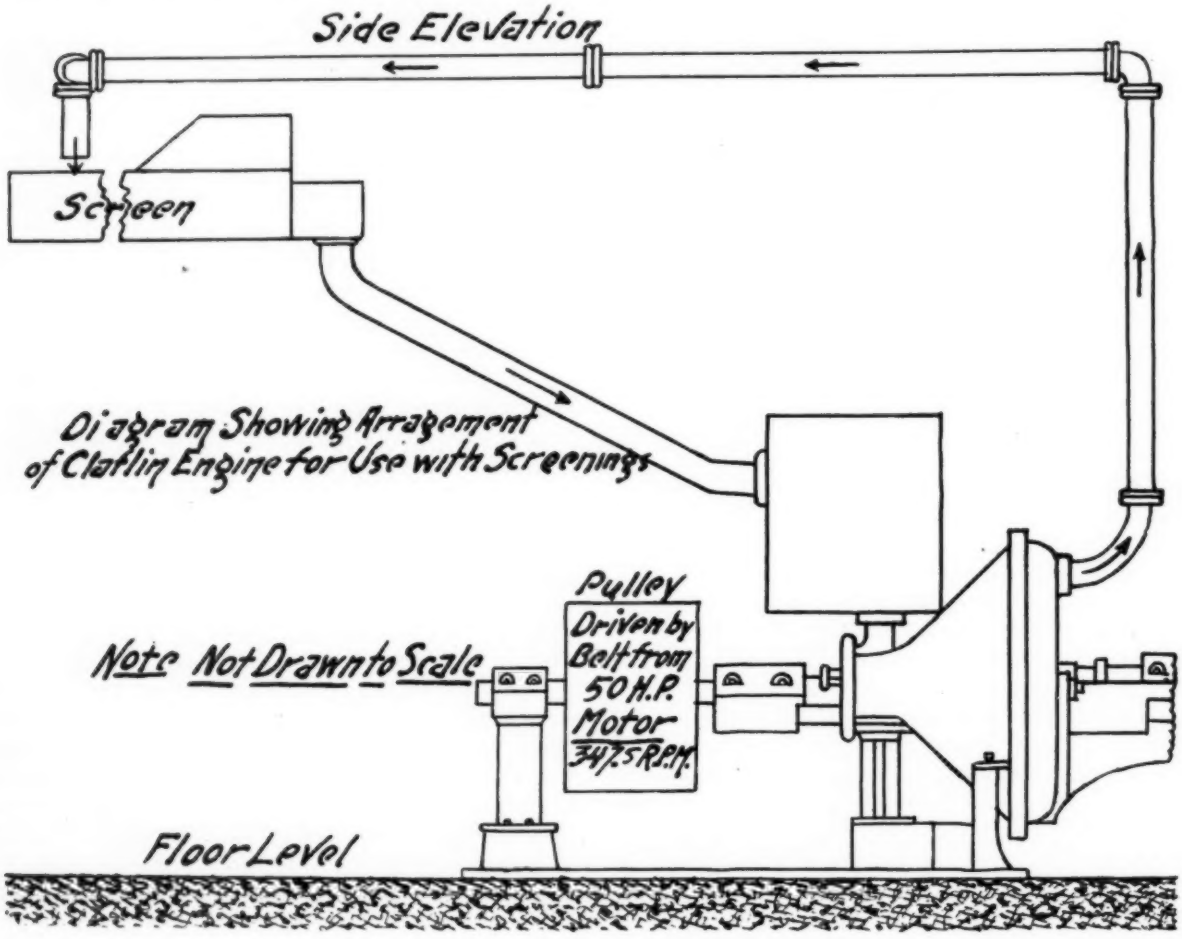
MORAL—If string beans are 15 cents a quart and navies 5 cents, buy the navies and string 'em yourself.

Training is everything. The peach was once a bitter almond; cauliflower is "cabbage with college education." Safety is only self-preservation, says the National Safety Council.

More Pulp from the Wood

THERE are many wastes in the average pulp and paper mill. No doubt, if the proper thought was given to such subjects in the average mill, many places would be found where savings could be effected.

The accompanying cut shows a method by which considerable more good pulp can be secured in many of the mills than is now being done. This illustration shows the refuse screenings being piped from the screen, run through a refining engine and back again over the screen. That part which does not go through the screen the next time, makes a circuit again through the engine, and again back over the screen, and finally—practically all of the fibre goes through the screen into the stock chest.


Side Elevation
Screen
Diagram Showing Arrangement of Claflin Engine for Use with Screenings
Pulley Driven by Belt from 50 H.P. Motor 347.5 R.P.M.
Note Not Drawn to Scale
Floor Level

This method is used in one mill to handle sulphite pulp and the amount of what is ordinarily known as sulphite screenings, is comparatively nothing in this mill.

The same method is used in one ground wood mill where there is a great saving effected. All the splinters and pieces that will not go through the screens make this circuit from the screens to the refining engine and around a number of times until practically all of it disappears through the screens.

It might be well for many of the mill managers and engineers to look into this proposition and see if they cannot also make considerable savings by a plan of this kind. There are a number of different types of refining engines that can be used.

Losses on Paper Machine

IN an address before the Northwestern Division of the American Pulp and Paper Mill Superintendents' Association recently held at Wisconsin Rapids, Wis., Mr. Sidney D. Wells, assistant in charge at the Forest Products Laboratory at Madison, Wis., said: "As the margin between the cost of raw material and price of finished product becomes narrower the only alternative is to produce more product with the same or smaller amounts of raw material. This will involve painstaking work in studying where losses occur and how they may be

avoided, and the superintendent with the responsibility of maximum production and the highest quality consistent therewith cannot devote his attention to these details without the danger of curtailment of production.

"The logical method of doing this is by delegating it to an organization such as the Forest Products Laboratory, whose object is to perform this particular function. An example of some work they have done along this line is the studies on the cause and prevention of decay in wood and pulp which was started through Dr. Kress's efforts, carried on with the support of the paper manufacturers, and encouraged by the sympathy of the superintendent. The work has led to what is believed are some very effective methods for reducing the loss.

"Another study much less in magnitude but of considerable interest and importance is that of the losses on the paper machine," said Mr. Wells. "I recently had an opportunity of studying such losses on one of the book and news machines of a mill in a neighboring state," he said. "In times past if 30 per cent of the material added to the beater ran down the river, it did not cause very much worry because pulp was cheap. In fact, few attempts were made to ascertain where the loss occurred or what it was. The situation now is considerably different and the manager of the mill referred to wanted to know. I was there two weeks and measured the volume of water being wasted from the paper machine, the amount of fibre, clay, and soluble material therein and such other points as were related to the problem throughout a period of eight operating days. The figures obtained were very interesting and I shall give them briefly:

Fibre	Tons	In Paper Tons	To Sewer Insol. Tons	To Sewer Sol. Tons	Unaccounted For Tons
Sulphite	45	...	..	..	..
Book stock	41	...	..	..	..
Shavings	18½	...	..	..	..
Groundwood	200	...	..	..	..
	304½	254	38½	6	6
Clay	41	27	14	..	..
Alum } Size } Silicate	10½	4	½	7	-1
	356	285	53	13	5

"It was found that even the fact that measurements were being made seemed to reduce the amount of loss, and, as a result of the study, changes are being made which will effect very material savings. As I have intimated, the first step towards reduction of loss is to find out where it is and how much. It is then easy to convince those directly in charge of operation and also the powers that be that possible inconvenience and a certain amount of expense is worth while."

Why Pay for Water?

By J. N. STEPHENSON
Editor, Pulp and Paper Magazine of Canada

YEARS and years ago, probably very soon after wood pulp was introduced as a paper making material, it was found necessary to have a basis on which to calculate quantities, cost and selling price. Someone evidently weighed a piece of pulp and after drying it completely, found that it lost 10% of its weight and immediately assumed that all pulp exposed long enough to ordinary atmospheric conditions would arrive at a state of equilibrium when it would have moisture equivalent to 1/9 of the actual bone dry fibre. Pulp in this condition has been given the name "air dry;" that is, a mixture of wood fibre and water containing 90% of the former and 10% of the latter. It is obvious to anyone having even the slightest knowledge of Physics, that this is not a definite relation because with every change in the humidity (moisture content) of the atmosphere, there will, of necessity, be a corresponding change in the moisture content of pulp. Further than this, it is impossible to say that a shipment of pulp has a certain percentage of moisture content throughout, because of the different rate of evaporation or absorption at the surface and at the interior of the package.

The paper mill is not particularly interested in the amount of water in the pulp except as this affects the freight charges and the quality, moist pulp as a rule being more easily worked into a good sheet of paper than when abnormally dry. The paper mill buys pulp for the paper making fibre it contains and in the manufacture of paper from it, adds a great deal of water and a number of other substances. Most of the added water is removed in the process of manufacture and the finished product contains an amount of water which bears no relation whatever to the amount contained in the original pulp. It is, therefore, quite unscientific to base the purchasing price and the calculation of quantities on such an assumed combination as is represented by the term "air dry pulp," even though investigation has shown that 10% is a very close average figure for the amount of moisture contained in pulp exposed long enough to ordinary atmospheric conditions.

In the testing of a sample of pulp from a shipment, in order to determine the quantity to be charged or paid for, it is necessary to dry the sample completely. The resultant weight of the dry sample divided by the original moist weight, gives immediately the content of actual fibre. From this a simple calculation gives the actual weight of paper making material in the shipment. If the matter were left here, the mill

would have a figure that would correspond directly with the condition of other materials as weighed and used in making paper—bleach, rosin, lime, soda-ash, dye-stuffs and fillers, are weighed and calculated as dry materials. How foolish and unnecessary, therefore, it is to convert a perfectly correct and easily used weight of fibre which is the basis of the whole industry to a fictitious value which involves not only a useless calculation introducing an additional source of error, but which expresses values in terms that require explanation to be understood.

With the introduction of scientific methods of cost analysis and process control, it is about time that pulp and paper manufacturers adopted the sensible plan of basing costs and calculations on the basis of the bone dry fibre in a shipment of pulp.

A Comment

"IN THE September issue of The Paper Industry there is a reprint of a paper on 'Sulphite Pulp,' read by Mr. P. A. Paulson, before a class in papermaking at Neenah, Wisconsin.

"This paper gives a very clear review of the fundamentals of this industry and is in general well adapted for its purpose, but I beg leave to challenge a couple of statements on the composition of the acid.

"On page 849 Mr. Paulson says: 'If the acid contains too high a percentage of Calcium it requires a much higher temperature to complete the cooking.' In my experience I have found the opposite to be the case. This is natural, because Magnesium Oxide is a stronger base than Calcium Oxide and consequently is harder to separate from its acid radical.

"Mr. Paulson says further: 'It is recognized that a high per cent of Magnesium is essential for the better grades of pulp.'

"This is a broad statement which has been much discussed and to my knowledge never proven or admitted by the trade in general.

"Some people on this continent using high Magnesium acid claim to get a 'softer' pulp, but as to 'better grades of pulp' in general it must not be overlooked that all Scandinavian sulphite is made with high Calcium acid and this pulp is certainly used by many papermakers in this country for the very highest grades of paper of all kinds. It is also worth remembering that 70 percent of all sulphite pulp manufactured on this continent is made with high Calcium acid, and it is only fair to admit that some of this pulp belongs under 'better grade.'

"It would be interesting to get the views of other sulphite men on this subject. O. L. BERGER."

Economic Losses in the Paper Industry

By C. I. McNAIR, Jr.

THE paper industry, like all other industries, has been through a period of extraordinary business inflation from causes incidental to the war. The war and its attendant rainbow have now passed over the horizon and we come face to face with the debris. A brief historical sketch of this period will show some of the causes for our past inflation and the evil effects which are with us at present and which require a broad remedy in order to safeguard the future.

Historical Survey

The years 1909 to 1914 represented in the paper industry, the normalcy to which we are now called upon to return. During this period we took little thought of raw material because of its evident plentifulness. Our market, although extensive, required constant but uniform efforts on the part of our salesmen and gave incentive to our superintendents; our plants were in operation with a regularity that gave steady employment to our men, and we faced very little in the way of inequality in prices and freight rates. In other words, there was a general satisfaction for the average operator, an opportunity for optimism on the part of the most aggressive and the natural following of hard luck stories from the least aggressive.

The normal increase in market and the shifting of products among mills took place along natural economic lines. If the market required an increase in one particular grade, a shifting of products occurred, which spread the decrease over practically the entire industry and which consequently was hardly serious.

During the winter of 1915, this period of normalcy was interrupted by a temporary slump in activity, which was felt by some to be of an exceedingly grave nature; consequently, we saw retrenchment, which resulted not in a general chaos, but in a careful and systematic attempt to eliminate waste. If the slump had not been so short lived and the process of house cleaning had been able to maintain, the industry would have gone into the war inflation in a very healthy condition. Unfortunately, during the year 1916, there came a general awakening of business, and the paper industry ran into it as blindly as all others. During this year the weed seeds of expansion were sown broadcast. At first they followed along economic and conservative lines and the increase maintained in places ideally adapted to normal expansion. But the attractive and seemingly unlimited market and the high prices penalized the conservative and favored speculation.

The expansion in the pulp industry proceeded and with this came the demolition of pulpwood resources with utter disregard for the prime suitabilities of different species of wood. The resultant increase in production was so general that it presented a problem in the marketing of the surplus. The solution followed during the years 1917 and 1918, when we prepared to mill not only all of the available pulp but considerably more. During the year 1919, this took on the proportions of a vicious circle, whereby the grinder and the digester engaged in a headlong race with the paper machine for supremacy. The acceleration continued with a final fruition during the year 1920, and now having reached the pinnacle of development, we can look around us and find extensive newsprint mills without visible means of support, either financial or from the standpoint of raw material; we find book paper mills with no raw material within several hundred miles; and we find board mills entirely without a market.

The market which caused the expansion was largely built up by the centrifugal force of the business development during the war. Our domestic customers felt that they must assure themselves of constant operation by maintaining sufficiently large stocks, which would insure them against interruption by shortage of fuel, the car shortage and other war difficulties. In addition, the collapse of industries in European countries brought us a foreign market, which is now utterly destroyed by their revival.

In the raw material market we have competed with each other in the destruction of resources, both in this country and in Canada, for the purpose of conversion into stocks, which are now difficult to dispose of. Our own raw material has suffered a tremedous blow and what remains of it must be carefully guarded in the future. The Canadian raw material, which we have always thought unlimited, has also suffered from the gigantic depletion, and we awake to find that it must be reserved for Canadian manufacture.

The Present Situation

In the meantime, we are struggling along endeavoring to fit this high development over a greatly reduced requirement; we are doing this by ruthless and extravagant exhaustion of our raw material, utter disregard of excessive freight rates, substitution of expensive fuel for cheap electrical power, and by throwing the cost sheet away; and the net result of all of this is part time operation of all mills, which makes a fair living for none.

This situation is untenable in that it will only result to the detriment of the paper industry and the consumers of paper. In suggesting a remedy, we look naturally to the law of supply and demand; it is true that the cruelties and blessings of this law cannot be either legislated against or tampered with. There is but one thing that can be done: the disturbing economic factors can be eliminated or shifted about in order that the law may have an opporunity to work for the advantage of all, rather than for the advantage of none. If the market demanded an addition, as it did in 1915 and we were to select a site for that expansion we would look for a place, which would combine to the best advantage, all the following factors: nearness to raw material, nearness to a broad market, cheap power and an abundant supply of personnel. If we had built such a mill, or if all of our mills were measured by this standard, the workings of the law of supply and demand would operate to the mutual advantage of all. Therefore, it seems logical that we should apply this rule to our present situation and see how far it fits. In places where we find the standard and the ideal, we can make no improvement; this is obvious because regardless of market conditions these mills will continue the advantage over all others. In places where the standard is not complete, we must make such adjustments as are necessary and in places where there is no economic reason for a continuation, we must eliminate.

Survey of Raw Material Resources

Divide North America into component parts, which will give a general uniformity of raw material for each part; this will give us a division of approximately as follows: Quebec, Ontario, Northeastern United States, Atlantic States, Southern States, Lake States, Central States and the Pacific Coast.

In Quebec we find an abundance of coniferous woods ideally suited to the manufacture of ground wood and sulphite pulp for conversion into newsprint paper. We find a scattering of other woods, which should be prepared chemically for the production of kraft papers. We also find an abundance of cheap water power, which is necessary for the manufacture of ground wood pulp.

In Ontario, generally speaking, the nature of the raw material is practically the same as Quebec, with the exception that there is probably a greater legacy of jack-pine left as worthless by the original loggers.

In the Northeastern States, we have a limited amount of all species of woods suitable for pulp production in varying grades.

The woods of the Atlantic States are probably limited to the production of pulp for book, wrapping and board.

The raw material in the Southern States should be reserved for the production of such chemical pulp as will produce wrapping paper or board.

The situation in the Lake States is practically identical with that of the Northeastern States. Both of these sections were largely the scene of early exploitation in newsprint, and with the decline of spruce and balsam, have gradually broadened out into the

manufacture of all grades. It is well to bear in mind, that with few exceptions, power in both of these sections is rapidly advancing in value and consequently cannot be considered as permanently adapted to the manufacture of ground wood pulp.

The raw material in the Central States includes a negligible quantity of adaptable pulpwood but a great quantity of waste papers and waste materials, which are worked into various grades of book papers and board.

The raw material of the Pacific Coast, like that of the Northeastern States and the Lake States, is of a department store nature but presents different problems, owing to the difference in species of the trees, also the limited market.

Application of Survey to the Present Situation

In the proper application of an outline of this sort to the industry, it would be necessary to have at hand all the detailed information in regard to quantities of the different species of wood and tonnage of the varying grades of paper. Even without this comprehensive information, it is not difficult to find a great many instances in the paper industry where economic losses are self-evident. There are some mills in operation and others projected, where the entire raw material is pulp transported from distances exceeding five hundred miles; the resulting freight being an economic loss, in the nature of a practical donation to the carriers. Other mills are manufacturing paper from pulpwood brought even greater distances, and this condition should be considered as even more flagrant, in that the outgoing freight tonnage involved is reduced to approximately one-third of the incoming freight. This means that three tons of pulpwood are hauled over five hundred miles and the freight donated to the railroad in order to save the freight on one ton of paper for a lower mileage.

The book paper industry is replete with examples of cases where the operator has spread far out into neighboring states and even into Canada, to procure his raw material.

There are other instances where mills utilizing a vast amount of power, are located hundreds of miles away from a fuel supply and have no possible opportunity for the generation of electrical power.

Waste in Incomplete and Improper Utilization

Another great disadvantage of the present system is the constant competition among mills manufacturing different grades of paper for raw material. There are wide areas of forested land held specifically by newsprint mills for the spruce and balsam contained therein; by the soda pulp mills for the short fibre woods, and by sulphate mills for the jack-pine and tamarack. The result is that the newsprint mill cuts trees best suited for its purpose and either wastes or uses what is left to no advantage.

The soda pulp and the sulphate mill, both follow the same system. With the gradual decrease in timber resources of all, the competition for stumpage increases, and whenever an opportunity arises for purchase of new limits, all three jump in with the instincts of the law of self preservation. The highest bidder wins a Pyrrhian victory and the others save their money at the expense of their permanency.

The remedy for this situation lies in the proper handling of woodlands, or in the merging of forest holdings of adjacent mills. Carry on this policy on a broad scale in connection with the proper allocation of industries, and we will have the right wood made into the right paper at the right place.

Waste in Misplaced Equipment

On the whole, the war and the expansion has brought us an interest in equipment, which will give us better, greater and cheaper production. Unfortunately, a great deal of this equipment has been installed at such excessive cost that we cannot now entirely appreciate the expenditure. In our present quandary, it seems more of a handicap than an advantage. The solution of this problem must follow along the same lines as the solution of the raw material question. Is the equipment in the right place? Would you feel that a fast machine, at great cost, could operate economically on a large proportion of storage pulp or lap stock? Would you feel that an expenditure in the most modern grinding equipment would be profitable in a place where power cost was excessive? Or would you feel that the installation of expensive heating equipment would be worth while in a place so remote from the market, that the freight rates would eliminate your competitive standing with mills poorer equipped but with better location with reference to the market? All of these questions are vital and pertinent, not only to the solution of our present difficulties, but to the future expansion of the industry.

The cards have been dealt and dealt wrong; one man has a hand which is no good to him but which might help his neighbor; the next man's hand is no good to anyone, while the third man has a lot of good cards, which he is going to keep, and a lot of poor ones, which he is using to the detriment of others.

All of the foregoing may be very effective as destructive criticism, but who is going to stop the game and order the players to lay their cards on the table, so that they may be sorted out to the best advantage? By what method and what line of action can we rid ourselves of the present evils and insure a healthy, sane and economically sound future?

The following outline is suggested in the hope that there may be some elements in it which might prove practical and applicable. There are some features of the plan, which obviously are so hopelessly tied up with a wavering national policy, that fruition seems

a long way off. Nothing, however, seems to affect business interests more keenly than a blow in the wallet; consequently, the tremendous economic losses arising from the present situation and affecting not only our own industry but the public at large, may have some effect in enlisting the public interest.

Suggested Remedies

(1) A detailed and comprehensive estimate by co-operation of national and state foresters on the remaining supplies of raw material suitable for the manufacture of paper and fibrous materials.

(2) A similar survey by the proper officials, of the utilization of raw material and the quantities and uses of the resultant products; the object of this survey being closer and more consistent utilization.

(3) A careful and conservative policy in the sale of stumpage and forest lands by the national and state governments. There are many instances where state and forest lands have been sold to parties, who have been unable to utilize the raw material without a considerable economic loss, either in transportation or in logging. There are other instances where exchanges can be made between the national and state governments and private corporations which will result in the consolidation of stumpage lands without any sacrifice on the part of the public's interest.

(4) A comprehensive review of the freight rate situation as affecting raw materials and finished products in the paper industry, and following this, concerted action on the part of the industry resulting in the establishment of rates, which will gave an opportunity for raw material to reach the market as a manufactured product in competition with foreign products.

(5) An exposure, rather than an encouragement, of the efforts of wild cat and unsound promotion in future expansion; in the execution of this policy the trade magazine can be of invaluable assistance. There has been in the past, too much commendation of this sort of exploitation.

(6) The closer and more intelligent application of the cost system by the industry as a whole.

(7) Finally, there should be some method, possibly through the general association, of reaching the public and the legislative bodies on the question of taxation laws on stumpage. Everywhere, we hear criticism on the part of the public for our continuing destruction of the forest wealth. The question of reforestation is advanced as the only possible solution, and we are expected to fall in line with this policy, regardless of cost or consequences. The fact is that as long as the owner of forest land is taxed, year after year, for a crop that takes from twenty-five to seventy-five years to mature, he will only hasten the day when he can cut his crop and turn it into finished products. On the other hand, he will never become very enthusiastic about replacing it and paying interest and taxes at a prohibitive rate until it is ready to cut again. This feature is the great stumbling block to progress in reforestation and is a basic evil in the present status of the paper industry.

New Bleach for Paper in Australia

FOR some years past persons connected with newspapers in Western Australia have been experimenting with various classes of Australian timbers, but until recently were handicapped by the costliness of bleaching materials, which had to be imported, states the Melbourne Age. Some time ago, however, a deposit of alkali was discovered at a place on the Geraldton line and is being landed at Perth at about 30 shillings a ton. This facilitated the work of the Forest Products Laboratory, which, with the assistance of various newspaper proprietors, has been busily engaged in successful experiments in paper making. A model paper-making plant, purchased at a cost of £650, was used in the experiments, and the samples produced are complete, except for the surfacing. It is claimed that newsprint equal to the best Scandinavian could be produced from karri waste obtained from the mills. The karri is a very hard timber, the inner portion of which is a mahogany color, but no difficulty was experienced in bleaching it out. The breaking strength of this paper is said to be 1.2 greater than the Scandinavian and Canadian papers. It is believed that the paper can be made at less than £12 a ton.

In addition to the paper made from karri, paper has been made from bleached and unbleached pulp obtained from the Queensland silky oak, mountain gum, spotted gum and blackbutt from New South Wales, and the Victorian mountain ash. The mountain ash makes the strongest kind of paper, and is thought to be suitable for ledgers and bank papers, and sufficient of the timber is obtainable in Victoria to more than supply the needs of the Commonwealth. With regard to karri, the mills are at present spending a large amount of money to have the waste products burned, so that it would save them an enormous amount, if, instead of being burnt, these were given to the paper mills at a nominal cost.

Trees

I think that I shall never see
A poem lovely as a tree.
A tree whose hungry mouth is prest
Against the earth's sweet flowing breast;
A tree that looks at God all day
And lifts her leafy arms to pray:
A tree that may in summer wear
A nest of robins in her hair;
Upon whose bosom snow has lain;
Who intimately lives with rain.
Poems are made by fools like me,
But only God can make a tree.

—*Joyce Kilmer.*

Annual Fall Business Conference of the American Paper and Pulp Association

Held at the Drake Hotel, Chicago, Illinois, November 1 to 4, 1921

THERE is no doubt now, on the part of the American Paper and Pulp Association, that a semi-annual business conference is a decided advantage in the affairs of this great body which comprises more than twenty affiliated associations, and that Chicago has proven itself to be the proper place to hold it. Manufacturers and merchants from all the paper centers of this country and Canada attended the fall business conferences of the American Paper and Pulp Association and the National Paper Trade Association at the Drake Hotel in Chicago, November 1 to 4, 1921. The holding of the symposium last April in New York, as a cross section of the industry from the viewpoint of the various manufacturers, was met with such favor, that it was decided to extend the idea to the entire industry for the fall conference, with the manufacturers, merchants and consumers all represented. The plan proved a complete success.

The conference started on Tuesday, November 1st, with the regular quarterly and semi-annual meetings of the associations of Book Paper, Card Board, Cover Paper and Pulp Manufacturers, the Salesmen's Association, the Book Paper Converter's Division, and the High Grade Paper Conference with Merchants. On Wednesday, November 2nd, meetings of the associations of Gummed Paper, Waxed, Vegetable Parchment and Writing Paper Manufacturers took place. The Wrapping Paper Manufacturers' Service Bureau and the Sulphite Division also held their meetings and the Woodlands Section held its third semi-annual conference. At 1:30 p. m. the Fine Paper Division of the National Paper Trade Association held its meeting in the French Room of the Drake Hotel.

The Glassine and Greaseproof Manufacturers held a breakfast meeting at 7:30 a. m. on Thursday, November 3rd, and at 9:30 the Coarse Paper Division of the National Paper Trade Association met in the French Room of the Drake.

General Session

The General Session of the Fall Business Conference of the American Paper and Pulp Association began at 10:30 a. m. in the Grill Room of the Drake Hotel.

The Manufacturers

Speaking for the manufacturers, George W. Sisson, Jr., of Potsdam, N. Y., discussed the present condition of the market for coarse papers, such as wrapping and other papers of that type.

"In the interest of the ultimate consumer, the speculative element in the handling of paper should be eliminated," said Mr. Sisson. He said that the business situation in this industry was now exactly where it was thirty months ago, when the cycle of business, starting with general inactivity, developed the prosperity felt in 1919 by the paper industry, as well as by business in general, followed by depression and months of reduced production and a decreased volume of business.

"The two fundamental factors, the general financial situation, and the completion of the liquidation of stocks made when raw materials were at the highest point ever known, now favor a period of better business," said Mr. Sisson. "Liquidation has been completed, and these fundamental conditions indicate that the time has come when reasonable optimism and strong constructive effort should take place of the pessimism, fearfulness and hesitancy which have been the logical accompaniments of the late period of depression. The financial factor in the situation has now reached the point where it may be fairly said that it is no longer deterrent, if indeed it is not already working steadily toward a powerfully constructive position.

"It would seem from consideration of these matters today that the manufacturers of coarse papers can by careful handling of their business from now on anticipate a steady and satisfactory return to a condition of normal production, normal shipments, and normal profits. This will be the more assured if those who merchandise our product realize that there should not be a speculative attitude in our relations, but that each should render service to the other on a fair basis of 'pay for value received' to the end that the public whom we both finally serve shall be supplied its needs at a fair cost, consistent with stability and continuity in the business of the manufacturer and the merchant.

"Without any desire to whip up business or industry beyond the careful, really conservative sane return which present conditions justify, I believe that the time for over-caution and foreboding has passed, and that now is the time to act and to move forward with courage."

Norman W. Wilson, vice-president of the Hammermill Paper Company, Erie, Pa., speaking for the fine paper manufacturers, was next to address the meeting and his address is published elsewhere in this issue.

J. H. Stannard, of the Grand Lake Paper Co., New York City, speaking for the converters of paper, told of the way in which his branch of the industry sees the sure return of prosperity.

"The manufacturer," he said, "must recognize that the converter provides him with a big portion of his market. Many do not realize the manner in which the product of the paper mill is going into use through the bag men who are constantly finding new ways in which to extend their business. The bag manufacturer is working with the purveyor of foodstuffs, both fancy and plain, to protect foods in shipment from filth while going from the factory to the table.

"This applies equally to such converters as the manufacturers of glassine, greaseproof, waxed, and other papers which are used to wrap food.

"In 1920 the grocery bag business dropped off amazingly. It was two months after this change before the paper manufacturer felt the depression in industry. Now, however, the tables are turned. The grocery bag, indicator of public buying, is in demand. The grocery bag business came back in August. You paper manufacturers are now feeling the return of prosperity which we recognized two months ago was at hand. When the public is buying, the whole nation is prosperous."

The Merchants

Edward F. Herrlinger, of the Herrlinger Paper Co., Cincinnati, Ohio, president of the National Paper Trade Association, spoke for the merchants in part as follows:

"This subject of business conditions, as I see it, is founded on four fundamental principles which go to make up the business conditions of the country. These four fundamentals to me seem to be the financial condition, the manufacturing condition, the merchants' or distributors' condition, and the consumers' condition. If the time would ever arrive when we could get all those four fundamental conditions working in perfect harmony with each other, I think no one would doubt but what the millennium had been reached. It is not only improbable, however, it is impossible.

"In these days of talking, almost everybody refers to golf, and I find myself in exactly that position. Most of you, I presume, are golfers. Day after day you go to the golf links, having in mind that each of your clubs will work in perfect harmony with each other, and day after day you find that when you master one club the other club fails to work, and instead of coming in with your coveted 84, you pull up with your usual 110, and then try it again next day.

"The thought occurred to me that if I could leave with you just a few suggestions, not necessarily to deny or confirm but to weigh and consider, the time that we have given to this would not have been ill-spent.

"Let us dwell a few moment on the banking situation. The banking situation, in my opinion, is in a healthier state than it has been any time within the last five years, and I say that notwithstanding the clearings have decreased twenty-five per cent during the last year.

"I agree with that prominent automobile manufacturer who published an article a short time ago to the effect that our Federal Reserve System was not lending a helping hand in the process of our return to normalcy. The Federal Reserve System was inaugurated for the purpose of lending to us an elastic currency and for the purpose of helping us in any financial difficulty, and for the further purpose of removing the power from Wall Street. But I don't believe that it was ever the intention of the framers of the Federal

Reserve System that any one of the regional banks, or the system as a whole, should make a profit of two hundred per cent; and I do not believe that with fifty per cent of all the gold in the world in our country, the Federal Reserve System has done its share toward liquidation to the manufacturer and the distributor of products in this country.

"I have studied the peak rates of interest for rediscount purposes in the different sections of the country, and I find that the decline in the price of money, one of the most necessary commodities we have today, has been as low as six per cent in some quarters and up to between twenty and twenty-five per cent in other quarters. In my humble opinion, today the rediscount rate of the Federal Reserve System should not be over four or four and a quarter per cent. You must understand, as one of the prominent gentlemen in Washington said, that it might be easy to convince nine-tenths of the people but it still becomes necessary to convince two-thirds of the Senate.

"Just a word or two about the manufacturers. It little behooves me to tell you manufacturers anything about this industry. That would indeed be again presumptuous on my part. As staid old manufacturers you have led individual concerns to success year after year, and you have facilities for learning the conditions that exist in the paper industry, not only from without but from within.

Paper and Population

"I want to call your attention to one thing that probably you have not thought of, and I am indebted to your secretary's office for some statistics about the paper industry that have been furnished to me. I want to call your attention to the production of paper, or rather I might say the increased production of paper during the past ten years as compared with the increased population of our country.

"During the last decade, the increase of population in our industry was 14.9 per cent, and I will read to you, on a percentage basis, some figures relating to the production of paper. Figuring this on an eighty per cent basis, so as to make it equal for comparison only, the production of paper in 1909 was 4,216,000 tons; exclusive of news it was 3,041,000 tons. These 1909 figures can be used as 1910 figures because there are no figures available for the year 1910. In 1920, the production of paper was 6,480,000 with news, and 5,119,000 tons excluding news. That shows that between 1910 and 1920, including news, the production of paper in the United States has increased fifty-three per cent, and excluding news it has increased sixty-eight per cent. If the present ratio of production were continued on the same basis during 1921, the increase including news would be sixty-six per cent. Now the thought occurred to me that if the theory is correct that a given number of people consume about the same amount of commodity within a given period of time, providing the number of peole is large enough to form an average and the period of time is long enough to form an average, we have got to look around and see what we are going to do with this increased production of paper, unless we assume that the population during the present ten years is going to be much larger than it was during the past. And I hardly think that is probable because of the restricted immigration laws that are in force in this country at the present time.

"Therefore, my suggestion to everybody in the industry is to do everything they can to encourage not only a more liberal use of paper where it is being used, but also the use of it where it is not being used. Each manufacturer and each distributor should lend a willing ear to anybody who contemplates the use of a paper product as a basis for the manufacturing of any new commodity. That is our only salvation in the paper industry unless we are going to have regular periods of stagnation.

"The paper business is fortunately one in which there is a legitimate margin of profit for anybody who has the nerve to try to get it. It is just in between two particular businesses that I have in mind. I remember one time I asked a friend of mine who was in a business that we might say is now nearly extinct, but not altogether, why it was that he was able to extend such promiscuous credits. He said, 'Well, if we get the bung and the barrel back we are even anyhow.' The other extreme is a man I have in mind who told be his goods were sold on such a close margin that after sending a man four dun letters and finally receiving a check with a deduction of $6.39 he was even.

"I just want to say a few words to you about this jobber or merchant. He is going to be more loyal to you than he has ever been before. He is going to be more loyal because he is being taught to be more loyal, and he is going to be more loyal because he is going to learn that it is to his best interests to be that way. I think the day of the paper distributor becoming a sort of bounder on the sea of commerce is over. I think the day when the average paper merchant wants to buy a car of paper and takes one of your paper directories and writes eight or ten concerns and then sits down and figures them out and says, 'Send it to Jones,' is over. I think the paper merchant has come to realize that he is part and parcel of a few mills, at least to so regard himself, and to consequently work in harmony with them. I think that is the way the paper business is going to be conducted in the future, and there are many other industries that are being conducted along those same lines today.

"It might not be entirely impossible or improbable for a paper manufacturer to send one or two of his distributors his price list for correction before he sends it out. Of course, you will agree such a thing is unheard of now; but it is being done in other industries. I talked to a manufacturer one time about that, and he said that in many instances the distributors of his product to whom he had sent his price list before issuing it, had raised the prices on certain commodities, telling him that he was selling them entirely too low. Wouldn't that be a wonderful thing in the paper business!

"I don't know what else I can say about paper, so I think we had better drift to this little insignificant consumer, the fellow who individually amounts to absolutely nothing, but collectively—oh, what a power he wields! Mr. Consumer spends in just such proportions as he receives. Let's be just a little patient with the consumer; let's be liberal with the consumer, because after all he makes the conditions that surround us all. When the consumer has nothing he buys nothing; when he buys nothing we sell nothing. Therefore, let us be fair with the consumer; let us pay him just as liberal

Picture taken at the joint luncheon of the American Paper and Pulp Association and the National Paper Trade Association, November 3, 1921, at the Drake Hotel, Chicago

wages as we can, but at the same time he must understand that he must share his part of the burden of liquidation just the same as the rest of us, or there never can be any normalcy; and railroad labor as well as all other classes of labor must share its part of the burden.

"I was talking to a gentleman this morning, and I asked him about the conditions in the paper business. I knew you did not care anything about my particular views, but if I could reflect the views of ten or fifteen or twenty merchants, it would be all that you might expect of me. This gentleman expressed it this way: 'Business may not be good, but there is a more restrained pessimism in existence than there was at any time during this year.' I think that expresses it fully.

"I want to say for the distributors of paper that they are with you. We have always been in the habit of looking into the mirror of nature and seeing our own reflection without consideration for the images of others.

"All I can say to you is that no matter what your troubles are, I believe that the National Paper Trade Association members, and those that are outside, perhaps, will come to your rescue during the year 1922 just as far as is within their power."

Another speaker for the merchants was O. A. Miller, of the Central Ohio Paper Co., Columbus, Ohio, who said in part:

"It is the manufacturers' business to make paper, and the merchants' sphere to sell it. One is as essential as the other, neither can prosper at the expense of the other, for they are inter-dependent, and the closer the co-operation between them the greater the success of both. Once in a while a manufacturer breaks over and tries selling direct in all or part, but he rarely gets away with it, and never excepting in cases of monopoly, and this is more difficult every year. I think the manufacturer does not fully appreciate the service to both mill and customer the merchant renders. His great warehouse enables the mill to have its product always within easy reach of the consumer, who is greatly benefited in turn by drawing quickly from the merchant his entire requirements from one source, saving time and expense.

"There has grown up a bad practice, both manufacturers and merchants being at fault, in making cut prices on direct sales, as against the merchant's stock, which should be favored rather, because of the great expense of warehousing, storage and handling charges. The manufacturer is greatly benefited by having his product on hand at points of distribution without cost to him, and the consumer as well is benefited by having the stock from which he can draw his small and miscellaneous needs promptly, so that the merchant should get credit and compensation for this service.

"As to market conditions—I think we all feel the quickening pulse, and I trust we may soon realize an upward movement in increased demand and fuller time in the operation of the factories in all lines. We cannot get well under way until all wage earners willingly take their share in reconstruction, and all makers and distributors, all along the line from the raw material to the consumer, do likewise, taking advantage of all economies in manufacture and distribution, taking only reasonable profits in every transaction. One great fault some indulge in should be wiped out as uncommercial and harmful. That is the practice of raising prices every time a demand is felt in increased orders. We are going through a period that is most sensitive to every movement, and we need steady heads and nerves to combat the tendency to play on the fears of buyers. What we need is a stable market and that can never be attained until full confidence is retored. This will come when all feel their source of supply is assured through regular production, and that they shall have considerate treatment in all transactions, with freedom from scares or tricks to force buying. We are still on a high level of prices, but enough has been gained in revision to make it possible for further recessions to come so gradually that no one may be hurt.

"I plead with you, manufacturers and merchants, to maintain a high standard of ethics to the end that all may land safely on solid ground.

"We have been on the downward path for eighteen months, and if, as I believe, we are starting upward, we will do well to reach re-established prosperity in two years, but it will be a pleasant road if all work together in the up-building, as we must to succeed. Our greatest hope is in the fact that many fallacies are being dropped, and an era of wild extravagance is being cured by the hard times, and just as surely will patience and hard work in time cure the hard times, and restore prosperity to the whole country."

The Consumers

Speaking for the consumers, Thomas E. Donnelley, of the Lakeside Press, Chicago, addressed the meeting in part as follows:

"The printer is interested only in a limited amount of the products of the paper industry; that is, news, book papers, writing papers, cover papers and some cardboards or bristol boards, whatever that may be.

"Our two industries; that is, printing and what you might call the fine paper industry, are so intimately mixed up that it seems to me anything that spells prosperity or lack of prosperity to one, of course must affect the other. I suppose that of these papers which I mentioned, fully ninety-five per cent of them go through the printer's hands at one time or another.

"I have this message that I would like to say, and that is that no matter what the business conditions of this country—meaning the general business conditions—are to be in the near future, whether they are to be good, fair, indifferent or bad, as I see it the conditions in the paper business and the printing business should be a little better. In other words, if the tonnage of paper represents ten per cent of the tonnage of all industry as it has in the past, I think that in the future it will represent eleven or twelve per cent, so that no matter what the country does, I think you gentlemen will fare a little better than the average, and I base this upon this analysis: The only good thing that I have ever heard come out of the excess profits tax, which to my opinion is not a tax on excess profits, but a tax on brains, energy and enterprise, was the fact that it induced, during this year and a half of inflation, a great many people to advertise who never advertised before, on the theory that the government was paying forty per cent of the bill. As a result of that, a great many of these people who advertise in this broad-handed way, who had never advertised before, discovered that advertising paid, and they are now permanently in the market; they are permanent advertisers; so we have those added to the consumers of paper.

"I would like to say, however, something concerning the affiliations between the printer and the merchant and the manufacturer. I think we are going into this long period of declining prices very much better organized than we ever were before, because you have your splendid organizations, the merchants have their splendid organizations, and we have a very remarkable organization of over 5,000 members of all the important printing concerns of the country. By co-operation I can see that a great many things which before were left to haphazard can now be arranged and a great many things which have been unfair in competition may be eliminated.

Standardization

"I would like to speak of some of these things which we hope to accomplish by co-operation. The first is that of standardization. The United Typothetæ of America have several Committees on Standardization, and they have now employed a secretary who will give his entire time to this work. Of course, the greatest thing in standardization in the paper industry was accomplished by the paper manufacturers themselves when they went to the substance number. I don't think any standardization can ever accomplish what that has accomplished for the industry. Standardization is only useful if it accomplishes a purpose, and it is dangerous if it takes out the initiative that is always inherent in a man who is trying to make progress. In other words, if we standardize things so that it is almost impossible for a man with invention or initiative to break over that standard, really we are putting a noose around our own necks.

"There is the question of standardization of sizes. Of course, you have accomplished through the Typothetæ a most remarkable case of that in standardization of sizes of covers. I noticed some reports in one of the trade journals the other day, showing that two years ago it took a certain manufacturer eight different sizes to market sixty-six per cent of his product, while recently, through these two new sizes, he is marketing eighty-five per cent. That must have meant very much better manufacturing conditions.

"The question of reducing the number of sizes in stock and the number of weights is a question that cannot be handled arbitrarily; it must be done after a great deal of study.

"The committees of the three organizations, at least of the merchants and the printers, must get together and get data from all the principal merchants in the country and from all the principal printers, and find out what sizes and what weights they use, and in what quantities, to see if we cannot reduce the number of sizes carried in stock. I can appreciate that what would be a stock size in Chicago would not be a stock size in New York or a stock size in San Francisco. That is a matter for a great deal of study, but I think it is of a great deal of importance, and if you people will co-operate the way I hope you will, I think within a year we will at least get somewhere on that problem.

"In connection with the question of sizes, I would just like

to interject a few remarks upon a new size which is being promulgated very enthusiastically, called the hypotenuse oblong. Some German savant conceived the idea that he would make the proportions of a sheet of paper such that every time it was folded these proportions would always be retained and the whole question of sizes would be solved. That proportion is 706 to 1,000. The whole argument is that if you have a page one size and you fold it again, you get the same proportions. Now a 9x12 is a very handsome size for a quarter, but if you fold it to 6x9 where the proportions instead of being three to four are two to three, the 6x9 is a very much better size than if it had been six and three-quarters by nine.

"There are various tastes in the printing business, just as there are in art and architecture. For 500 years the best minds in the printing business, even before the invention of printing the best minds in the bookmaking business, have studied over the question of proportions of sizes, and anybody who has any knowledge of or is familiar with printing realizes that the small book you want long and narrow, and as you increase the size you want it wider. It is just as ridiculous for some German geometrician to say that the sizes of all printing should conform to some formula that he works out as to say that the magnificent and beautiful proportions of the girth in columns should all be changed because some engineer has some mathematical theory that they should be different.

"I just make this remark because I am afraid that somebody at some time will approach one of your associations and you will adopt the hypotenuse oblong basis without giving it thorough study. I am not saying it is not correct, but I think it is a question that deserves a good deal of further consideration.

"The question of weights is something which I think should be standardized. Of course, there is no reason in the world why we should retain the ream. I think everybody is agreed on that. In England they are trying to adopt the metric system. They are going to sell paper on the mill, which is a thousand sheets, and the substance numbers there are to be the number of grams in a square meter of paper. I can readily realize why England is so interested in the metric system, because a large proportion of England's product has to be marketed abroad and they are constantly coming in competition with the papers from Sweden and Germany. But the trouble about the English system is that the substance number has no designation, it has no connection with the weights in pounds of the paper which they sell.

Definition

"There is another question which we have got to take up, and that is the question of definition. The definition of the paper business is the most indefinite thing that I know of. I would like to have somebody here rise and tell me what a No. 1 enamel is, and when he tells me, I would like to have him deliver that goods every time I buy a No. 1 enamel from him. There are so many questions of definition which mean one thing to the manufacturer, another thing to the merchant, and another thing to the printer, that by co-operation we could clear up.

"Then I would like to say just a few words on the question of private brands. I know I am treading on dangerous ground when I talk on private brands. I know the merchant feels that if he has adopted, say, the Caxton brand of coated paper and has advertised it and sold it, that is his private possession and he has a right to do with it anything he wants. But let us take, for instance, the case of the Caxton brand of No. 1 enamel which is sold by Smith, Jones & Co. and manufactured by Mill No. 1 in Kalamazoo. We have used that brand of paper for two or three years; it has been extremely satisfactory, prints well, and on the basis of our past experience we go to a customer and sell him a large order, using this brand and putting this paper in as our sample and the quality of work which we are going to perform. For some reason or other between the time of our last order and our new order, Smith, Jones & Co. and Mill No. 1 in Kalamazoo have had a falling out and they transfer the making of that paper from Mill No. 1 to Mill No. 2. You gentlemen all know that two mills don't make the same kind of paper; they certainly don't print the same. We get that paper in here and we have an entirely different article. I say that we have a perfect right to demand from the jobbers that if they establish a private brand we should be guaranteed that that paper will be continued the same as heretofore, and if there is any change in the manufacturing conditions we should be notified so we could be covered in our contracts.

Hiding the Name of Manufacturer

"That brings another question, and that is the desire of so many of the merchants to hide where the paper is made. I am surely surprised that the manufacturers stand for that. I wouldn't, because if anything in our business is valuable it is a built-up reputation. Smith, Jones & Co. sell us 100,000 pounds of paper. They give that order to some mill throughout the country and we are never allowed to know who that mill is, and the mill knows that we don't know who it is. I believe that if the mill knew that we knew that that paper was coming from their mill, there would be a tendency for them to make that paper more carefully than they would if they said, 'There is no good-will with this order. It is simply getting the order out and getting the money, and we have to scrap for the next one.' I believe it would tend to a much better grade of paper if the name of a mill was marked on every package of paper that came out of it.

Printing Difficulties

"We printers don't know much about the technicalities of making paper, but I will say that we know a great deal more about it than the paper people know about the technicalities of printing. You know a paper manufacturer and a paper merchant think that everything that they make prints and that paper must have everything but printing qualities. The technical problems of a printing office are extremely irritating, and we have never had any help from the mills unless we went out and dug it out for ourselves.

"We had been buying for some years a certain grade of coated paper from a certain mill, and we were constantly having printing troubles. We would get an ink which we thought would run perfectly on that paper, and it would run for a few months and the new order would come in and we would have the whole trouble over again. It sometimes takes two or three days at a cost of from $25.00 to $75.00 to find inks to go on certain papers. I sent our chemist up to that mill, and this is what he found: that in making the coating or in mixing the coating, there were three chemicals they could use interchangeably for the same purpose, and this mill was in the habit of buying that chemical at that time which was the lowest. It made a beautiful looking paper but every one of those chemicals had an entirely different affinity for ink. The superintendent at the mill said, 'It is the first time I ever knew it made any difference whatsoever,' and I suppose there were hundreds of printers around the country cursing that mill out about that very thing.

"We have a lithographing department. We put a job on with paper that we have been using for a long time from a certain mill, and after five or six hundred impressions the transfer was gone. Our foreman came down and said, 'There is acid in the paper.' The paper salesman said there could be no such thing, the paper maker or merchant said there could be no such thing, but several months afterward the superintendent of that mill was down on some other troubles, and he admitted that they had used more alum in that paper at that time than they did before, and they didn't suppose that it made any difference whatsoever.

"I have named these things just to show you how a closer co-operation between the printer and the merchant and the manufacturer, who I think ought to be brought in every time, would aid very much in taking away or minimizing our troubles.

"I don't know that this is the place to say it, but I would like to say a word about the paper salesman. The paper salesman is an awfully nice fellow. No matter how grouchy you are, he always has a smile. He is willing to run his legs off to get you samples or get you paper for a dummy or something else. He will give you all the lunches your digestion and your self-respect will permit. He is a good golfer; he will take you out and play golf and let you win, but when it comes to selling paper on the merits of that paper as a printing proposition, he simply knows nothing about it whatsoever. It is a nice thing to do business on personality, but I would like to say, for heaven's sakes get your paper people to understand printing problems. If you as a paper maker or merchant say a paper will print well, your salesman can go out and get a sample some other printer printed on it, but he has no idea of the difficulties that that other poor fellow had. If you are going to sell to the printer and are going to be helpful to him, try to understand his problems and when you sell him the paper don't sell him paper full of alum or paper with a lot of short sheets or things of that kind. Try and sell a paper that will go through the presses rapidly and well and with no trouble."

This terminated the morning session of the Conference and at one-thirty P. M. sharp the Joint Luncheon with the National Paper Trade Association was held in the Ball Room of the Drake Hotel. The principal speaker, Joseph H. Defrees, president of the Chamber of Commerce of the United States of America, was introduced by President W. J. Raybold of the American Paper and Pulp Association and spoke as follows:

Luncheon Address by J. H. Defrees

"No gathering of business men in these times seems to be complete unless there is included in the program someone

"MICHIGAN"

Combination Steel and Wood Pipe

LONG DISTANCE CONVEYOR OF WATER AND PAPER STOCK IN PAPER AND PULP MILLS
Specially Adapted to Carry Sulphite, Ground Wood and "White Water"

Eighteen reasons why you should use "Michigan" combination steel and wood pipe

1—Durability of Wood Shell. 2—Sanitary. 3—20% more capacity than Cast Iron Pipe. 4—Simplicity in handling. 5—Light in weight. 6—Speed in laying. 7—Protects against freezing. 8—Not affected by Electrolysis. 9—Rigid inspection of materials. 10—Efficient construction of stave. 11—Strength of steel banding. 12—Protection of banding with asphalt coating. 13—Cannot burst under pressure. 14—Can be laid in a wet trench. 15—Short curves without specials. 16—Low installation and maintenance cost. 17—Responsibility of company. 18—Not affected by sulphur or chemical solutions.

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New York City, N. Y.....17 E. 42nd St.
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Montreal, Que., Can.....204 St. James St.
Boston Mass.....93 Broad St.
Cleveland, Ohio.....919 Ulmer Bldg.
Chattanooga, Tenn.....702 James Bldg.
Philadelphia, Pa.....318 Widener Bldg.

"Steel for Strength—Wood for Durability"

who speaks of business conditions. In the United States, while we suffered less from the World War than any other nation engaged in it and while, notwithstanding our tremendous expenditures, our wealth has increased proportionately more than any other nation and we are the richest—the creditor nation—of the world, we have our troubles and plenty of them both in degree and in volume.

"Obviously, the thing which is troubling us most at this time is decrease of consumption. The cause of this has occasioned much brain fag and consumption of white paper. The literature upon the subject is most extensive. Employing a phrase much used in 1917, "It was the war." Perhaps at the moment it may be as well to leave further treatment to the historians. It is almost equally trite to say that the decreased consumption is caused by decreased power of the peoples of the world, including ourselves, to buy. The most immediately important question to my mind and the question with which I shall occupy the few minutes I shall take of your time is—How may the power of consumption be increased?

"It will be agreed, I am sure, that high costs and the uncertainties of the future are the most important obstacles to be overcome.

Transportation

"None looms higher in the public mind than the transportation situation. Certain organizations of the railroad employees have placed before the public a threat to paralyze the business and industry of the country by tying up its rail transportation. This is the most dangerous and revolutionary threat made against our institutions since the similar threat in 1916. The threat was then avoided by the passage of the Adamson Law in circumstances which most certainly invited its repetition whenever the threatening organizations were so disposed.

"Prophesy, like history, being outside of my purpose, I will venture to say no more than that the matter of this strike will soon be a part of history. I will endeavor to treat rail transportation questions without regard to that outrageous phenomenon.

"The cost of transportation is one of the chief elements in the cost of all of our necessities. Almost all of the industries of the country have had in recent years opportunity to make very considerable profits with which to expand their operations and protect themselves for the future. During the war it was especially so with many, but it was certainly not the case with the railroads. For nearly thirty years before the war their charges and many of their methods of operation were regulated by the Government, but the act empowering this regulation contained no provision requiring the Interstate Commerce Commission in fixing rates to consider expense of operation. During the war, they were operated by the Government, and, therefore, for years they have been unable to devote sufficient funds to maintenance and rehabilitation of their properties or to expansion of equipment and territory served. These and other causes, not necessary to mention in detail, make the condition of the railroads most critical and difficult of treatment.

"No element of our national life is more important, and to none is it more essential in the public interest, that it should have adequate income to meet the full requirements for public service. Under the provisions of the Transportation Act of 1920 and the action of the Interstate Commerce Commission, freight and passenger rates have been raised to a point where it is commonly agreed that they constitute one of the most substantial obstacles in the road to business and industrial recovery. These rates are largely the direct result of increased payrolls made necessary by increased wages and changes in working conditions and rules imposed by the War Administration of the Railroads and also by wage increases awarded by the Railroad Labor Board created under the Transportation Act of 1920. These increases substantially absorb the increases in freight and passenger rates and great as these increases in freight and passenger rates are, the funds are not afforded to make the necessary betterments of which I have spoken. Indeed, the rates of rail transportation are so high that they most definitely contribute to a reduction of traffic and thereby defeat the very purpose of the increases allowed by the Interstate Commerce Commission.

"It should be said in passing that this has been recognized by the railroads and they have voluntarily reduced the rates upon important basic commodities for the purpose of assisting in their movement. It seems to me, therefore, that it is imperative in the interest of the railroads as such, as well as of the business of the country, that there should be an immediate and adequate reduction of freight rates adjusted to a fair basis with reference to the relative value of commodities and with special consideration to the rates upon raw materials.

"To justify these reductions in freight and passenger rates and in the public interest having due regard to the financial ability and necessities of the railroads, the wages of the railroad workers must be reduced relatively with the reductions which have obtained in other lines of effort in comparison with pre-war wages. The rules respecting working conditions set up during the war are now under consideration by the Railroad Labor Board. Such as are unsound must be abolished. The financial relations of the government with the railroads must be settled. A statement issued by the railroad executives on the authority of the Interstate Commerce Commission shows that the wage payment since the Adamson Law went into effect on January 1, 1917, have increased from one billion, four hundred sixty-eight million dollars to three billion, six hundred ninety-eight million dollars in 1920, an increase of two billion, two hundred thirty million dollars. While in 1916, forty cents out of every dollar received by the railroads for transportation service went to labor, now sixty cents of each dollar is so applied. The present payments to labor are estimated to be one hundred million dollars more than the total operating revenues of the roads in 1916. The net return on property investment of the railroads has been reduced from 6.16 per cent in 1916 to less than one-third of one per cent in 1920, notwithstanding the necessary omission of essential repairs and betterments.

"Accepting 1913 as the pre-war normal, the index numbers in August, 1921, based upon 100 for 1913, approved by the President's recent unemployment conference, in which organized labor was represented by chiefs of its leaders, afford interesting comparisons:

Cost of living:	
May survey	180
August survey	165
Average price to producer of farm products	109
Average price to producer of live stock	113
Average wholesale price of foods	152
Average retail price of foods	153
Estimate of railway wages based on average annual compensation, third quarter 1921	226
General estimate all union wage scales	189
Lumber, average Southern pine and Douglas fir (at the mill)	128
Pigiron, Bessemer	128
Steel billets, Bessemer (Pittsburgh)	115
Copper, ingots electrolytic, early delivery, N. Y.	75
Lead, pig, desilvered, for early delivery, N. Y.	100

"From these figures, it is clear that the difference between railway wages and general wages in 1921 is much greater than it was in the pre-war period; that railway wages have increased in much greater proportion than general wages. When this disproportionate increase in railway wages and the substantial decrease which has occurred in the cost of living and in the prices of foodstuffs to producers and wholesalers and of products of the mine and forest are considered, there is ample room for substantial reductions of their wages without injustice to the railroad workers.

"At the time the railroads were taken over by the Government, the Government guaranteed an annual return to the railroads equal to the average net earnings of the preceding three years. The Government also told the railroads that such additions and betterments as it might find necessary to make should be made by the Government at the expense of the Railroads. Additions and betterments to the amount of One Billion, One Hundred and Forty-One Millions of dollars were made by the Government. These were capital expenditures. The Government owes the roads hundreds of millions of dollars by reason of the guaranties. Congress is delaying the appropriations necessary to meet these obligations because there is a sentiment that the Government should set off the amount of these capital expenditures owing to it against the amount owing by it for the guaranties. This is manifestly unwise, and if done will absorb substantially the monies due to the railroads on account of the guaranties.

"The railroads cannot go into the market as things now are and sell securities in adequate amounts to make improvements and betterments of their facilities essential to economical and efficient operation except by the sale of securities at an abnormal and unreasonable sacrifice. This would be reflected in the expense of their operation for years to come. The Government should accept the obligations of the railways for these capital expenditures upon reasonable terms for extended periods and pay to the railroads now the amounts due them upon the guaranties. They are in effect current earnings. The railroads could then apply the amounts to betterments now needed.

"With rail transportation costs reduced upon the principle I have stated and the reduction in operating expenses resulting from the steps I have mentioned, I believe a long step

Nash Hytor, Vacuum or Pressure Pump

For Suction Rolls and Flat Boxes

Only three principal parts.

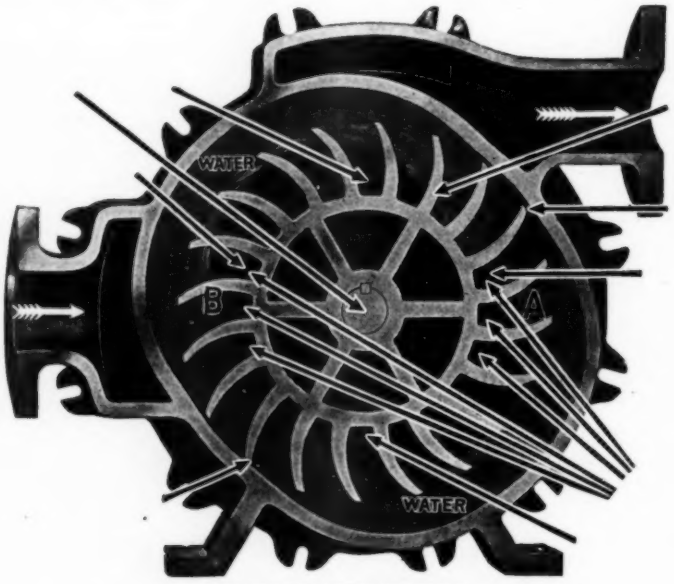
Only one moving part, the rotor.

Shaft is mounted on high grade annular ball bearings outside of casing.

No valves, pistons, rods, crank shafts, loose vanes or gears.

Compression is balanced, eliminating side thrust on the rotor.

Note that rotor runs in casing with large clearance.



High Efficiency. Absolute Reliability.

Air delivered entirely free from pulsation, and therefore can be measured with a Venturi meter.

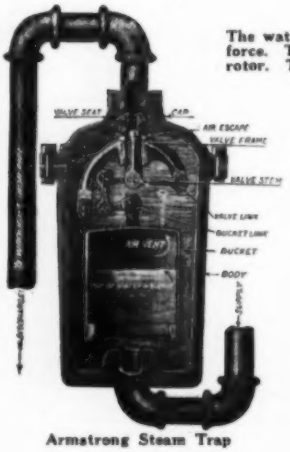
Air is washed as well as compressed and can contain no oil or other impurities. Can be constructed of Acid-Resisting Metal.

Upkeep cost is practically nothing.

Expert attendant not required.

PRINCIPLE OF OPERATION

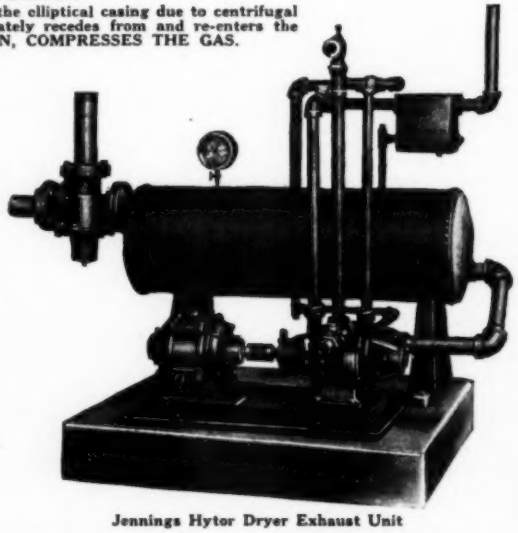
The water revolves with the rotor but follows the elliptical casing due to centrifugal force. Twice in a revolution the liquid alternately recedes from and re-enters the rotor. THE WATER, ACTING AS A PISTON, COMPRESSES THE GAS.



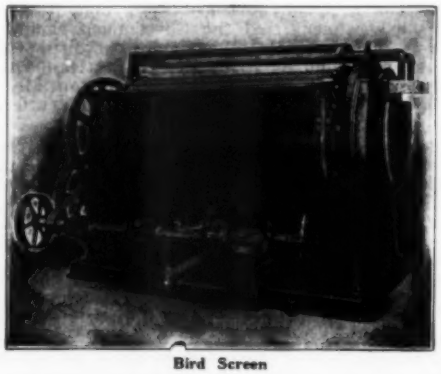
Armstrong Steam Trap

IMPROVED SYSTEM FOR HANDLING CONDENSATE FROM DRYERS

This consists of an individual Armstrong Steam Trap on return line from each dryer main return header connected directly with the Jennings Hytor Dryer Exhaust Unit. This insures circulation and highest efficiency of dryers.



Jennings Hytor Dryer Exhaust Unit



Bird Screen

Other up-to-date Specialties regarding which information will be given on request are the following:

BIRD SAVE-ALLS
BIRD CONTINUOUS BEATERS
BIRD STRAINER VALVES
WALPOLE ROTARY SCREENS
BIRD INWARD FLOW ROTARY SCREEN
BILLINGHAM DEINKING & DEFIBERING MACHINE
MEYER GOVERNOR
ARMSTRONG STEAM TRAPS
FARNHAM SUCTION ROLL
NASH WIRE & FELT GUIDES
HUBAND-NASH SUPPORTED DECKLES
WOODCOCK-WALKER FELT CLEANING APPARATUS
O'NEILL FOURDRINIER & CYLINDER WIRES

SOLD BY

THOMAS H. SAVERY, Jr.

1718 Republic Bldg. CHICAGO, ILL.

in aid of revival of business and industry of the country and of the power of consumption of the people will have been taken.

Taxes

"Another obstacle is the high cost of Government. The appropriations for the fiscal year beginning July 1, 1921, aggregate more than four and three-quarters billions of dollars. These figures before the War would have been inconceivable. Much is being done and much more may be reasonably expected to be done as affecting subsequent years by the forceful efforts of General Dawes and his associates now specializing to eliminate waste and duplication of effort, and to induce the application of sound business methods. This can only be a partial relief but its effect will be approximately immediate. The major weight of this burden, as we all know, comes from the cost of previous wars and of preparation for possible future wars. The percentages of the application of these appropriations of billions of dollars for a single year were published in a recent number of The Army and Navy Journal and are most interesting as well as shocking:

Obligations arising from World War	52.2%
Postal Service	11.0%
Navy Department	9.5%
War Department	8.8%
Obligations from previous wars	7.0%
Public Works	4.7%
Primary functions of government	3.9%
Miscellaneous	2.9%

"In short 77½% for War Purposes and 22½% for all other purposes.

"The shock of seeing the enormity of our past misfortunes, we must bear. The taxes to meet this burden, we must pay cheerfully and freely, but the burden to come from future appropriations of this sort, it may be, can be reduced to the minimum. The cost of preparation for future wars is still a matter for earnest and devout consideration, not only in our own interest, but in the interest of the whole world.

"The world has come to appreciate that it is impossible for the competition in armament to continue and I believe much may be expected from the conference of the powers in respect to its limitation which our President has called to meet on the eleventh of this month in Washington. There are many and delicate questions involved but the burden is so universal and the wish of all peoples in respect to it so alike that the statesmen assembled may be expected to exercise the greatest patience and do their utmost to bring about the removal of causes of war and therefore find the proper basis for limitation.

"But the taxes to be paid to meet the present burden must still remain with us. Congress has been struggling with the necessary legislation for months. The bill passed by the House seems not to be at all satisfactory to the Senate Committee having it under consideration. There has been vigorous and long debate in respect to the Excess Tax and when its repeal should become effective, and equally vigorous and extended debate in respect to the higher brackets of the income sur-taxes and what should be done to or about the unduly rich. Economists and sober-thinkers who have no prejudices or partisan political needs to respond to have no difficulty with either subject. The inevitable effect of the Excess Profits Tax is to increase prices abnormally, therefore decrease consumption and by the decrease of consumption decrease production and employment. This in turn decreases the power of consumption. In this time of industrial depression, the excess profits tax is not a reliable basis for the production of revenue and it retains only its nuisance value. The proposed repeal should be made effective as of January 1, 1921.

"The reduction of rates in the higher brackets of the surtaxes is of major importance. One of the great burdens which the business and industry of the country has had to carry and will continue to have to carry if the rates in these brackets are not sufficiently lowered is the diversion from the ordinary channels of industry of the investments of the persons affected by these high rates. The high rates have caused the investment of hundreds of millions of dollars in tax-free securities, which otherwise would have been invested in the bonds and other security issues of industries at reasonable rates and thus the tremendous costs which have been imposed upon the issues of the necessary long-time securities to provide capital for betterment and expansion would have been avoided.

"Tax rates which will make it possible for the business of this country needing money to compete with the offerings of these tax free securities are necessary not only in order that business may produce at reasonable cost to the consumer, but also—what some people seem not to have observed—are necessary to induce the rich to pay their fair share of the support of the Government under auspices of which they have become rich. As it has been, and as I fear it may be, it is much a matter of choice. If the rich man invests in tax-free securities he avoids payment of taxes. Whether he shall so invest or not is purely a matter of volition, with the temptation largely in favor of the avoidance.

"The expectation of the Senate Committee as reported some weeks ago to make liberal reductions in these brackets was hailed with approbation by the business of the country. That approbation has diminished by reason of changes which the Senate Committee has made, still contemplating reductions but on another scale. This scale, while giving increased reductions upon incomes under $86,000, runs the surtaxes up to 50%—a point which means a total levy of 58% upon all income in excess of $200,000. It may be that there are only 3,400 individuals who now pay taxes upon incomes of more than $100,000, but there were 6,600 in 1916. In the last year for which I have seen statistics, the persons with incomes of $100,000 and more reported an aggregate income of nine hundred ninety millions of dollars.

"In 1916 they reported two billion one hundred eighty-eight millions of dollars.

"These statistics, like all figures, may be tiresome, but they happen to point some forceful lessons. They show that high surtaxes upon larger incomes have driven huge amounts of capital into tax free investment, and it would seem the whole investments of thousands of wealthy persons. In other words, the high surtax brackets have deprived the Government of the revenues it should have had from those incomes and have at the same time taken billions of dollars of money away from industry and commerce when it was needed more than at any other time in our history. My plea is not for exemption of the rich, my plea is for moderate surtaxes in order that business may have capital, that the government may have revenues, and that the rich may pay their fair share of the nation's taxes. It is said the change of view of the Senate Committee was made necessary by the insistence of what is called the Agricultural Bloc in the Senate. Let us believe that this bloc has not alone in view this one important section of our people as distinguished from the general public welfare. Let us hope that continued success will not give it a sense of power which will dwarf the breadth of its view of the public interest and cause it to become increasingly sensitive to the special interest which it is said to represent. Such is usually the effect of specializing in a single direction. You all remember the story of the doctor who thought he had a sure cure for fits—all symptoms of a sick patient indicated fits to him and he treated accordingly.

"The farmer has suffered a greater liquidation than any other class and his suffering continues. He is entitled to the very greatest consideration and the fullest protection consistent with the rights of the community. All of us must depend upon him and we wish him to have the benefit of every device consistent with the public interest. To that extent, but no more, must he have special consideration. There are peculiar conditions affecting his line of effort which justify it. There is, however, no room in this country for class representation as such and nothing is more dangerous or likely to be productive of tyranny and wrong upon the rights of others than the continuance of blocs in representation of any single element of our community. Equal right under the law is at the very foundation of our form of government and the principle is in danger if class-consciousness becomes prevalent in our law-making bodies.

"I am proud to be able to say that a cardinal principle of the operations of the directors and officers of the Chamber of Commerce of the United States, to which I have devoted much of my time for more than five years, is that if a project is not for the common good it is not for the good of business. This, however, though important, is beside the tax question.

"Perhaps the most important thing to be said about the tax bill at present is that it shall be passed. The best possible tax law is desirable but even one which leaves much to be desired is better than to continue longer in uncertainty and without guide in this important matter.

Tariff

"Another obstacle to our industrial revival is involved in the tariff upon importations. It is not an easy question to dispose of but it is easy to see that business cannot safely progress and engagements be intelligently made in the absence of reasonable certainty in this important field.

"It seems to be agreed that the emergency tariff passed early in the year will be extended to next February, and that in the meantime, there will be effort to agree upon a permanent

Standards for Naval Stores Products

Users of naval stores tell us that the naval stores industry has suffered because of too little scientific research and development work in connection with pine products. They complain that accurate knowledge is wanting of the way differences in rosin, turpentine, and pine oil affect the various processes and products in which they are used; and also that sufficiently definite standards and specifications for these products are either not determined or are not generally maintained.

Our rigorous system of chemical control permits us to produce naval stores that meet specifications unerringly—that is an advantage inherent in our methods of production. Our technical service is trying to solve many problems that are perplexing to consumers. We can promise no startling discoveries, but we do promise something that has heretofore been lacking: wholehearted devotion to the service of the industry by one of the strongest chemical organizations in the country, with complete facilities and solid resources behind it.

Naval Stores Division

HERCULES POWDER CO.

Wilmington, Delaware

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HERCULES
Naval Stores
Produced Under Chemical Control

tariff bill. That a permanent bill should be passed at the earliest possible date or its consideration postponed to a definite date in the future, seems clear. In either event, business could exercise judgment as to its production, purchases and sales and proceed with confidence that its decisions would not be overturned by governmental decisions which it could not anticipate. There is, however, much to be said in favor of a definite postponement in furtherance of the desires of both the high and the moderate protectionist. The conditions of foreign manufacture and money exchange are so constantly fluctuating that there can be no settled basis or attitude from which reliable deductions can be made as to what duties should be. A tariff with rates that may be adequate today and for a time in the future may well be expected to be much out of line with conditions which may obtain a year or two years hence. The foregoing statements must, of course, be taken to apply to the tariff generally and not to particular schedules.

"This matter of the tariff, aside from the necessity to provide for our industries at least equality of opportunity in competition, is of paramount importance as affecting our foreign trade. For adequate foreign trade cannot be expected unless we buy abroad as well as sell abroad. Trade is human. Our customers, if they are to remain customers, not unnaturally expect to sell to us. Any tariff now enacted should take into account our new situation as a creditor nation and in now having many customers abroad, it should at once be fair to those customers and their necessities as well as to the requirements of our own industries. Our capacity for production is much greater in many articles than our capacity for consumption. This is particularly so as to the products of the farm, mine and forest. In 1919 percentage of exports in quantity of these articles was as follows:

Wheat	23.5
Rosin	58.3
Rice	53.2
Cotton	60.5
Tobacco	44.5
Hops	105.0
Copper	57.4
Zinc spelter	30.4
Turpentine	38.7

Note the hops. It is interesting to observe the increase since the 18th amendment.

"Our surplus products must either be marketed abroad or there must be a corresponding reduction in the amount produced. Nearly one-half of our population is engaged in producing foodstuffs and raw materials. We need to maintain our foreign trade not only to fully employ those engaged in such production but also because the processes of our production, distribution and commerce generally have been created and are based upon the disposition of such surpluses abroad. We do not want to take the time and have the disruption which will result from endeavoring to readjust and become self-sufficient in our own country, even if it were possible. New distribution of our population would be necessary. New trades would be needed to be learned and other processes of distribution of products sought. We would better continue in our old relationship and foster and revive them as best we can. Indeed, I believe that the means of communication and distribution which now obtain place all of the civilized countries in more intimate relation with each other and make them more dependent upon each other than were the several Colonies which joined when our Federal Government was formed. I do not believe it would be possible for even this great country to be self-contained and isolated even if it should be argued that it would be desirable. The whole civilized world is akin and the prosperity or demoralization of one country has a definite effect upon the others.

"Commercial relations and reasonable commercial access for each to the other, especially in respect to raw materials, must be arranged upon a fair basis if limitation of armament is adequately to be accomplished—if the chance of future wars with their consequent horrors and burdens is to be minimized.

"If we are to avoid this reduction in production by the disposition of our surplus of raw materials and manufactures abroad, it is important that the power of consumption of these foreign countries and the stability of their market conditions be restored as promptly as possible. We know that a small surplus of production over demand for consumption, whether that surplus be in products subject to export or products solely for home consumption, fixes the price of the entire amount produced.

Foreign Trade

"A real obstacle to export trade now existing is the violent fluctuations of foreign exchange measured in dollars. The purchaser abroad has always been accustomed to long-time credits. The depletion of the cash means of the purchaser in European countries caused by the War makes these long-time credits to him even more necessary than before, yet the violent fluctuations in exchange make it impossible for the foreign buyer to make extensive purchases either upon long-time or short-time credits unless the credits are very short and the opportunity to dispose of his purchases almost immediate. His contract, if he buys from us, is to pay in dollars, and dollars in his currency constantly vary in marked degree. Since I was abroad in July the value of a dollar has more than doubled in Germany and in Austria. The cost of a purchase even upon 90 days credit will have more than doubled. The value of a dollar sometimes changes many points in a day and therefore the foreigner now buys from us only what he absolutely must buy.

"The causes which now underlie these fluctuations in the value of foreign currencies are fundamental and must be dealt with fundamentally rather than superficially before the risks can be minimized and ultimately eliminated. They are:

"First, the unbalanced budgets of many foreign governments which result in constant inflation in currencies, both note issues and bank deposits;

"Second, the unregulated demands of the German Government for foreign currencies in order to make reparation payments.

"A third cause will arise if great care is not used in respect to requirements as to payment of principal or interest on debts owing by foreign Governments to the Government of the United States.

"It will be observed that these present and possible future fundamental causes of disturbance in exchange are largely political in character and will require governmental treatment. While these causes, because of their character and magnitude require such governmental treatment, we must recognize them also as grave economic problems, requiring the best business experience and ability in their solution. The citizens of the United States cannot assume the risks and responsibilities involved in dealing with these matters, nor have they the power to deal with them without the support of their Government.

"A committee of the recent Unemployment Conference, of which I was chairman, made the following suggestions upon the subject which it believed to be fundamental and which met the approval of the Conference.

"First, the approaching Conference for Limitation of Armament should result in bringing about a reduction in the military burdens and consequently the budgets of nations which are now maintaining excessive military establishments, and will be a long step toward arresting constantly increasing inflation, increasing depreciation and extreme fluctuations of the various foreign currencies.

"Second, the United States should be effective in the deliberations and decisions of the Reparations Commission and other agencies so that its influence may be exerted toward a reasonable control of the present unregulated payment of reparations by Germany.

"Third, authority should immediately be granted by Congress to enable the Administration to deal with the funding of foreign debts owing to the United States Government in such a way as to avoid injury to our country's foreign trade and the employment of our people."

Address by W. H. Finley

William H. Finley, President of the Chicago and North Western Railroad, gave a most interesting and sensible account of the present railroad situation in part as follows:

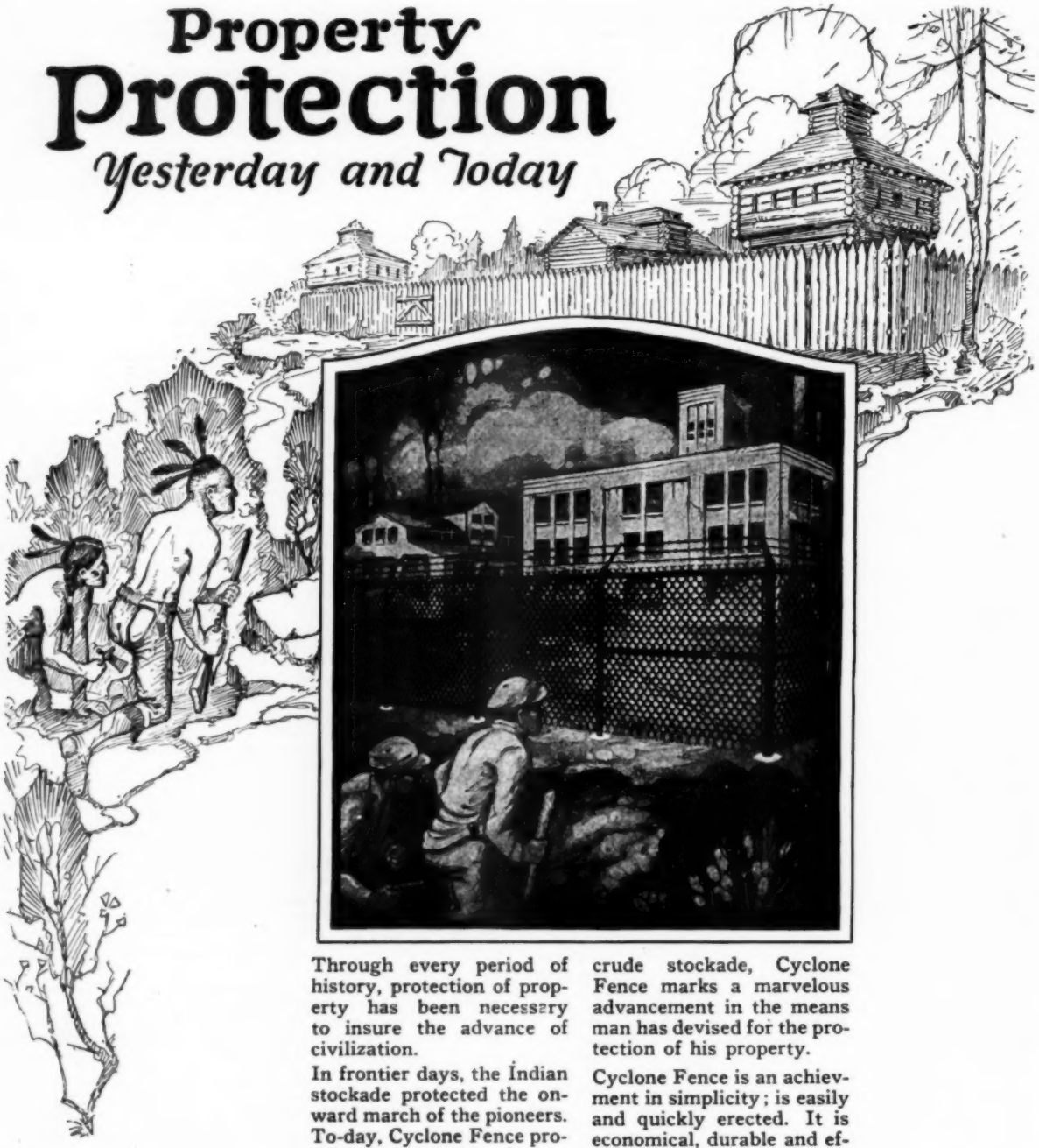
"What I would like to convey to the people and what I try to say to them whenever I have the opportunity of speaking to them, is the necessity for them to study and understand the railroad question themselves, because we get nothing in this country except through the force of public opinion. Public opinion is the arbiter of everything in this country, and it is necessary to have the proper knowledge of the situation when you are dealing with any question like the transportation question in the United States. The majority of people do not give their time or attention to the study of the railroad situation that they should. They do not know the handicaps that the railroads are compelled to work under; they do not know that the legislature in every state every year increases the cost of transportation without returning any economic gain to the people.

Car-Shed Bill

"As an instance of that there is the passage by states of what is called the car-shed bill. The state of Minnesota, for instance, in the last session of their legislature passed a

Property Protection

Yesterday and Today



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PROPERTY PROTECTION PAYS

car-shed bill that compels the railroads at any point where they have six car repairers at work for over thirty days, to erect a car-shed over them, heated, lighted, with lockers and everything to take care of their clothes and to protect them from the sun and the elements. And something that I can never explain to myself is how a farmer member of the state legislature votes for a bill to protect a few car workers from the sun and elements and never thinks of himself as he follows the plow.

Charges to Capital Account

"Under the Interstate Commerce Commission rulings, there are certain things charged to operating expenses and certain things to capital account. I want to give you some idea of what that means to the railroads today; and the continued growth of it, if something is not done to arrest it, means the absolute crystallization of the transportation in the United States; it means crystallization just as badly as it is crystallized in England today.

"Think of all the assessments for public improvement against the railroads, for a street in a village, town or city that runs along the railroads; that is charged to capital account and we must earn an interest charge on it. It doesn't turn one cent of revenue to us. These expenditures that we must make for non-revenue producing things are going to break our back as sure as the sun is shining today. That is piling up and increasing our capital charge until finally we will not be able to do anything but earn an interest on our capital account without anything for dividends or improvements.

"All these things that are ordered by the state and municipalities, such as track elevation, elimination of grade crossings, do not return anything in revenue to the railroads but have added to our capital charges, and we must earn an interest charge on them. That is mounting very much indeed and is one of the serious questions that we have to consider.

"They actually had a bill in the legislature of an adjoining state to compel the railroads to eliminate all the grade crossings in the state. An approximate figure showed it would bankrupt every railroad that ran into the state, yet it was seriously proposed. It seems in modern society, since the introduction of the automobile, that people have forgotten the old sign, 'Stop, Look, Listen!' You would be surprised at the number of trains that are actually assaulted by the automobiles.

State Taxes

"There is another item that is growing and increasing on railroads, and that is the item of taxes. The proposed increase of state taxes in 1921, or 1920, in Illinois amounts to thirty-three and a third per cent, in Iowa, twenty-four and four tenths per cent. I am glad to say, however, that we contested it in the court and got a decision of the court knocking it out the other day. In the other states through which the Chicago and Northwestern runs, it amounts to:

Michigan	12.5 %	South Dakota	14.95%
Minnesota	6.42%	Wisconsin	7.18%
Nebraska	13.80%	Wyoming	14.9%
North Dakota	4.71%		

"A total of 17.1 per cent increase on our taxes.

"This year, 1920, the Northwestern paid a total of $7,131,383 in state taxes, and $1,042,506 in Federal taxes, or a total tax bill of $8,173,889. This is equal to 72.26 per cent of the interest paid on our funded debt which in 1920 amounted to $10,440,294. It also is equal to 93.75 per cent of the total dividends paid in 1920, amounting to $8,826,275. The total taxes paid in 1920 represent 43% of the total sum paid out for interest and dividends.

Operating Expenses

"To give you some idea of what the railroads mean to the United States, I am just going to read you a few figures. In the year 1914, it cost $2,300,000 to operate the railroads of the United States. In the year 1920 it cost $6,000,000—the biggest single item that the American people have to pay. It is more than the cost to run the government of the United States.

"Labor's share of the earnings of the railroads has grown from 43.1 cents out of each dollar in 1912, to 60 cents in 1920, while capital's share has dropped from 25.2 cents to almost nothing. The meager return of 4.84 per cent on the property investment in 1912 has dwindled in 1920 to .32 of one per cent.

"Of course, the biggest item of the expense of the railroad company is the wage item, but there is not any question that other things have gone up accordingly and that the combination of these things is what has made transportation so expensive. With the wage level raised, we are paying two and a half to three times as much for a locomotive today as we paid in 1913 or 1914. The same is true of the cars and everything else that we handle.

"Transportation cannot be furnished for the same price that it was furnished in 1913 and 1914 if we have got to pay those high charges for labor and materials and everything that goes into the construction of railroads and the operation of railroads in this country.

"Figures compiled by our Bureau of Railway Economics show for the year ending August 31, 1921, the total operating expenses for the year were $5,161,780,829—a reduction of $218,876,981 as compared with the preceding year, or 4.1 per cent. That merely goes to show what efforts we have made in reducing our expenses, the economics we have introduced and the efficiency we have shown. Of course, the idea is prevalent among a great many that the railroads are extravagant and that they don't care what their expenses are, but I know of no class of men engaged in any business in the United States where their officers work harder, give more attention to and have more waking moments taken up by their business than the average railroad manager today.

"Expenditures for maintenance of way construction decreased 13.3 per cent and for maintenance of equipment 7.1 per cent, while transportation expenses were reduced only 1.1 per cent and traffic expenses increased 33.8 per cent and general expenses increased twelve and eight-tenths per cent. Taxes took $283,331,306, an increase of 10.4 per cent. Our taxes happen to be higher than the average, and the net railway operating income was $530,655,427 as compared with only $28,548,077 in the previous year. The operating ratio for the year was 85.38 as compared with 93.99 of the year before, an indication of what we have been able to do in the way of economics.

Existing Depression and Railroad Rates

"I know what is said about railroad rates, I know how much it means to all of you, but, gentlemen, the depression that exists in this country today is not due to railroad rates. If that was the only thing that was holding back business and the revival of business in this country, we would be in a very happy condition indeed, but the economic disturbance over the world that this country is sharing in, as well as the rest of the world, goes back to something more basic and more fundamental than any question of railroad rates. Other things must be considered and will have to be considered. I believe that no general business revival will come until conditions have changed through an equalization of values. High wages, high interest rates, high retail prices and excessive freight rates must be reduced before we will be on the proper basis, and no one item of that number will bring about a revival of business.

"I received a letter from the Governor of Nebraska the other day relating to conditions in Nebraska. I consider it one of the most statesmanlike letters I have received for some time. He took a very broad view of the situation, and in speaking of the crop conditions in Nebraska he said a little over half of the wheat had been shipped out of Nebraska and they had nearly all of last year's corn crop with the present corn crop added to it, and, of course, the price for corn was very low, but he said in this letter, 'If freight rates should be reduced to pre-war level, that would add about five cents per bushel to the farm price of corn in this state. This, however, would not be sufficient to encourage a general movement of this crop.' I believe he is right in that statement. There has to be more than a lower freight rate to bring about prosperity and a revival of business.

"The railroads have nothing in the world to sell but service. They can't exist and they can't continue unless they furnish proper service and satisfy the people. Therefore, they need the people with them. The people should be with them; the people should study their conditions and their case and help us all they can. We need their help. I am pleading for that today. We need the help of every man and every citizen because we cannot look to the politicians; we have always lost out when it came to the question of politics. We want the business man, we want the average citizen back of us, we want his help, and then we will go forward and furnish a transportation system. Not having that, I don't want to paint the picture that may happen.

Government in Business

"As far as our income is concerned, that is fixed by one governmental body. As far as our expenses are concerned, they are fixed by another governmental body. Gentlemen, as citizens of the United States I believe it is high time we began to consider this question of government in business. Back to the time of the cave man on up through all the

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onward march of the human race in every civilization, pagan and Christian, at some time some government tried to exercise its arbitrary powers and fix selling prices and the price of labor. They never succeeded as nations or as sections of society and they never will succeed in my humble opinion.

"I believe that the law of supply and demand is as immutable as the law that governs the movement of the heavenly spheres, and when it is interfered with it is bound to react. You can't stop it. I have been trained as an engineer. I have fought all my life the forces of nature, I know that I can dam a stream, but I know that finally if I don't provide the proper outlets it is going to wash me out. You can set aside these laws for a while but you can't get rid of them and they are bound in the end to react.

"Now when you come to a railroad system as a transportation system, there isn't any question that a good transportation system marks the difference between the forward and backward nations of the world. Take China with its immense population. Last year in the city of Hankow, wheat was selling for $2.50 a bushel; 300 miles away in another province it was selling for ten cents a bushel. Answer: Lack of transportation. So that thousands are starving in China today. The same is true of Russia. With the idealistic people that are in charge of it now trying new schemes in government, they forgot altogether their transportation system, and in their places like Moscow they are tearing down their buildings for fuel, while within a short distance, comparatively speaking, are the finest coal mines in the world, but in their idea of building up a new form of government they forgot all about their transportation system until it became a complete wreck. The result is famine, starvation, and the people of this country that have built up a magnificent transportation system are sending the food to feed the starving children of Russia.

"I am an enthusiastic railroad man and I always like to speak of the railroads and what they have done. When you think of the growth of this country, the development in the short space of time that it has developed from the time when the early settlers went up our rivers of the West here, established their trading posts here and there, and the hearty pioneer pushed out beyond through the wilderness and established his place with no communication but the stage coach or ox team, until today we have the greatest transportation system that the human race has ever seen, it is really marvelous.

"As these places were built up and as they became populous, a more rapid system of communication was necessary to bring into relation these widely scattered centers of industry, and there came into existence these larger and greater means of communication—the steam railroad. The promoters and projects of it were men of vision, men that apparently had all the confidence in the world in this country and its future. They pushed their roads out and made two blades grow where none had grown before.

"The Northwestern Railroad in the early eighties pushed their lines through the great agricultural state of Iowa. Farm lands were selling for $10.00 and $15.00 an acre. They issued three and a half per cent gold bonds to pay for the building of that road. Today that farm land is worth from $200.00 to $300.00 and $400.00 an acre. The gold bonds of the Northwestern are selling for sixty-five. There is the difference. The farmer is suffering; he has taken his loss and he needs all the help he can get. I am a farmer myself and I know that I can't sell my corn, but, gentlemen, this country can't be prosperous without a transportation system that can meet the needs of the country, not only meet the needs of the country but grow with it and expand and develop with it. We have been absolutely in an straight-jacket for five or six years. We have not been able to spend a cent in improvements, extensions or additions that are so badly needed. With all this money that goes into capital account, with no earnings as dividends, what sort of credit have we to induce the investing public to put their money into railroads and furnish the money that is so sadly needed today for these improvements and betterments?

"I believe, and I believe firmly, gentlemen, that a man who invests his money in railroad securities, in its stock, and furnishes that company with the cash to carry on its business, is entitled to a fair return on that, just as much as the man that puts his money in a savings bank and expects three per cent interest on it regularly."

Address by Charles W. Foulds

Charles W. Foulds, of Chicago, in speaking on business conditions from the banker's viewpoint, said in part:

"I am going to point out just one or two things that are very unreasonable in the general situation. They don't affect the paper business particularly, but they do show the evils that have crept in in this onrush of business. There has been a profiteering. You have heard of it. Everybody says it isn't he, he isn't doing it in his business. We are putting on too big a load. Here in Chicago some of the biggest merchants are selling a little pocket-knife for $5.00 that one of my friends picked up in Germany this summer for, in the depreciated German mark, the equivalent of six and a half cents. That knife is made by that famous cutlery concern in Germany—Hennings; and they have agents in New York; and so the Chicago house has to buy the product in New York and does not buy it in Germany. Even after paying the duty on that knife, the people in New York could charge forty-five cents for it and make a profit of two hundred per cent, and yet the Chicago firm sells it for $5.00 today. I want to tell you that those inequalities have got to come out before we are on the road to real prosperity. I think we will all agree that probably the retailer has been the slowest to come to his senses on this situation, but he is coming and he is doing his best. These things have to be ironed out.

"I believe the majority of bankers will say this one hopeful thing to you: as we go along this line of deflation, we have come probably to the low point. It doesn't mean we are through; we have got a lot of problems ahead, not only with railroad labor but everywhere else, but we have got to iron them out. As we go through these things I want to point out one thing. That is this: that if we believe in our American nation (I don't mean to wave the flag, although I did a great deal of it during the war when I was running the Liberty Loan here in Chicago), if we believe in American ideals, we cannot stand for the kind of thing that has been put over either by capital or by labor in the last few years. We have got to get down to brass tacks and common sense. These things are not American, and it comes just as much from one class as another.

"One of the ablest newspaper writers in the country, a friend of mine who worked for me in the last loan and was in charge of my news—Arthur Brisbane—had this in his column this morning: 'What is happening to money? The government wanted to borrow a few hundred millions at four and a half per cent. The man with money offered three times as much as he wanted. Speculators in Wall Street yesterday borrowed money for four and a half per cent. Wouldn't it be pleasant if business men that need money to build factories and employ men could get money at four and a half per cent?' Now he is a very brilliant man; he just picks out an idea and throws it out. As a matter of fact, you are going to get money at four and a half per cent before you know it, in my judgment. But the fact of the matter is that the man that borrows money in Wall Street in New York is not offering such a loan as would do you any good in operating a paper or pulp mill. He is borrowing upon security that can be sold in five minutes' notice, and he is borrowing on call, and his rate is four and a half per cent today and it may be twelve per cent on Monday. You couldn't do business on that basis. Mr. Brisbane knows that as well as I do, and yet he will put that in his paper.

"What I am speaking about is that we have got to come to a sane sense of things. We can't preach these things to these people; we have got to give the people the facts and the truth, get a fair amount of profit on our business and handle it carefully and successfully.

"I believe in a control of manufacturing business as well as other business. I think one of the great mistakes of the manufacturing industries in all lines in the last few years is that they have had no budget. We are getting into an era of budgets. We don't want to overdo it but it is worth something to think about it. You want to have some idea as to what you can afford to do in 1922 as a minimum and maximum of your operations. Most of us have gone along like Topsy and have just grown up. We have gone along and grabbed all the business in sight. If you could sell a carload of paper and pulp and make a dollar and a half on it, sometimes you would do it just because it made the increase for October a little more than it was for October a year ago. That is wrong. It isn't fair to your competitor or some other fellow that is having a hard time to get his output disposed of if you have gone in and glutted your market. You may have paid labor a little bit to get it out; that is the only good you have accomplished. If you would start out to do a minimum of $10,000,000 a year and a maximum of $14,000,000 and make your whole expenditures on that basis, I believe you would make more money net for the stock holders of your company than if you started out with no definite idea except that last year you did $10,000,000 and this year you must do more. You are always safe if you can figure the thing carefully as to what the minimum must be and what the maximum can be with the same organization."

The Motion Picture and Industry was the subject of a lecture given shortly after the luncheon by Douglas D.

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Rothacker, of the Rothacker Film Manufacturing Company, and typical scenes from films produced for paper manufacturers were shown to demonstrate the use of the motion picture for educational purposes.

The Conference closed with the meetings of the Tissue Paper Manufacturers' and the Toilet Paper Converters' Associations on Friday, November 4th.

Divisional Meetings

Gummed Paper Manufacturers' Association

Perfect packages packed in paper formed one of the topics of the gummed paper manufacturers of the United States when the Gummed Paper Manufacturers Association, at their meeting at the Drake Hotel on November 2nd, announced that it would participate in November's observance of perfect package month as planned by the American Railway Association and the American Railway Express.

A unique example of the use of gummed paper was brought out in the report that gummed paper tape is now being used to seal cases of clothing and cloth fabrics to protect the contents from injury by dirt or moisture through the cracks of the cases. Many such cases are made of very thin wood, some of three-ply plywood, and the gummed paper tape is being extensively used in the east to hermetically seal such packages.

Government experiments on fruit and perishable vegetable shipments in packages sealed with gummed tape were also reported to be under way, but the testing experts have not as yet been able to determine proper specifications for fruit shipping cases made of corrugated fibre or other paper boards.

A study of gummed tape, as compared with twine for wrapping shoes made by a big national company was reported at the convention of the Association, showing that the saving made by the use of tape instead of twine on half a million pairs of shoes was $1,556.

Provision was made at the meeting to carry on a more aggressive campaign in promoting the use of gummed tape paper and to work with the Government on the standardization of tapes.

Waxed Paper Manufacturers' Association

After the meeting of the Waxed Paper Manufacturers' Association at the Drake Hotel on November 2nd, O. B. Towne, secretary of that Association and the vegetable parchment, glassine and greaseproof paper manufacturers said, "Increasing orders for waxed and vegetable parchment paper sufficient to warrant a resumption of production by mills in this group, tell the story of how the the business in fancy foods has turned the corner.

"These papers are used for the finest kinds of food stuffs, for the wrapping of fancy foods, the luxuries. This kind of business is the first to fall off when there is business depression. Its return tells a sure story that the buyers of fancy articles are buying once more. The mills have been running at a very small percentage of capacity. Now, however, today's reports are that business is warranting the enlargement of operations.

"A unique feature of this industry, however, has been the growing demand for bakers' bread, as indicated by sales of bread wrappers, which form an important part of the market for waxed paper. The bread wrapper business has actually held its own through the entire period of depression, a significant indication of the manner in which the public is buying wrapped bakers' bread, instead of baking at home. This demand has also manifested itself in the extension of bread wrapping to bakeries which formerly shipped bread unwrapped. The confectioners are back in the market also for waxed paper for candies on a larger scale."

Woodlands Section Meeting

Heavy reductions in woods operations by the paper and pulp manufacturers of the United States were reported at the convention of the Woodlands Section of the American Paper and Pulp Association at the Drake Hotel, Chicago, on November 2nd, when Secretary O. M. Porter gave the results of a survey of wood on hand and projected operations.

There will be no immediate shortage of raw material for the reports indicate that there is still a large quantity of pulp wood in the hands of the manufacturers, even though this was put in at prices far above the presumptive cost of woods operations during the coming winter.

"Reports from forty-eight companies," said Secretary Porter, "are sufficiently distributed to provide probably an accurate estimate of the whole situation, seventeen being from New York, nineteen from the lake states, six from New England, three from Pennsylvania and three from the west."

The 1920 consumption of pulp wood by these mills was 1,855,005 cords and their stocks on hand on September 1 was 2,292,483 cords. Pulp manufacturers usually carry two years' stock of wood on hand, but this year are putting in only 792,630 cords. In view of the reduced operations in mills of the entire country, the total now on hand or contracted for of over 3,000,000 cords, normally only enough for 20 months, will be practically a two years' supply, indicating no shortage the coming year. The small input this year, however, less than one-half of last year's consumption, portends extremely low stocks in the fall of 1922.

"These figures," said Secretary Porter, in his conclusion, "reflect very clearly the present pulp wood market situation. American mills are overstocked with high-priced wood, and are curtailing their logging operations, in many cases from 50 to 70 per cent of the 1920 operations. Of the 87 mills making reports, 27 reported they were making no contracts for any wood this winter."

The meeting was well attended, and in his report Secretary Porter announced that, since the organization of the Section last November, about ninety representatives of woods firms have become members. Co-operation with the Canadian Section has been delayed owing to lack of funds in the Canadian Section, but plans are said to be in the formation which will very soon make this desired co-operation possible. Secretary Porter emphasized the fact that frank co-operation between the members through the medium of questions and answers will make the Woodlands Section of the utmost value to them.

Vice-Chairman C. M. Hurtibus, of the Hammermill Paper Company, presided in the absence of Chairman D. A. Crocker, who was unable to attend. The program consisted of a number of topics on which discussions were invited. Under the direction of E. W. Kiefer, president of the Port Huron Sulphite and Paper Company, Port Huron, Michigan, the future supply of pulpwood in the lake region was discussed.

Address by C. W. Boyce

C. W. Boyce, of the United States Forest Service, gave an account of the present stand of timber in the lake states as related to the pulp and paper industry. Mr. Boyce's remarks were as follows:

"In 1920 the interest in the remaining supplies of pulp wood throughout regions of centralization of the pulp industry was more or less crystalized. Previous to that there was considerable interest in remaining supplies but more or less passive. It has now gotten to a point where it is quite active.

"The Forestry Service have undertaken to collect the best information available concerning the remaining supplies, not only on account of requests for such information as we have received from the industry, farmers and buyers and people generally interested in the plup and paper industry, but also from a welfare and public point of view. The best estimates that have been gotten together previous to that were those included in the so-called Capper report with which you are undoubtedly familiar. However, those estimates had no direct relation to the pulp and paper industry. They were simply estimates of the standing timber based primarily on saw timber, and, therefore, last year the Forestry Service tried to gather the best information there was available as it was related to the pulp and paper industry.

"It must be borne in mind, however, when dealing with estimates that they are only estimates. There is no survey of the remaining timber resources that has ever been made. There has been an attempt to get funds and authorization from Congress to carry on such a survey, but that has not yet come through.

"As a result, the figures which I have been able to get are the average of the best estimates we could get from the various sources.

"The total supplies in the lake states in the Capper report, that is, the original forest area in the lake states, were about 103,000,000 acres, of which there remain at the present time in the neighborhood of 57,000,000 acres coming under the general term of forest lands. There is a further division of this area of forest lands as follows: Approximately 10,000,000 acres of virgin timber; about 14,000,000 growing saw timber which is not yet merchantable; about 13,000,000 acres of land supporting the forest growth of materials suitable only for cord wood, primarily fuel wood; and in the neighborhood of 20,000,000 acres with no forest growth of any value whatsoever.

"The area growing saw timber and the virgin timber area in the neighborhood of 24,000,000 acres supports a total stand of about 110,000,000,000,000 feet, of which about 40,000,000,000,000 is soft wood and about the balance of 70,000,000,000,000 is hard wood. Expressed in cords, the total stand of the different species in the lake states is about as follows:

"Spruce, 6,400,000; hemlock, 34,200,000; fir, 3,500,000; popple, 20,000,000; jack pine, 13,000,000; tamarack, 6,000,000; hardwoods, 80,000,000.

"The original stand of spruce is not definitely known. How-

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built into every wire that has left the shop of the Appleton Wire Works has been our aim during the twenty-five years we have been in business.

The fact that we have had to double and treble our plant and output in recent years, proves that we have attained these aims, at least to some degree. Every thought for the future, however, is based on the same proposition. These are some of the reasons why

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ever, it is known that spruce occurred in the northeastern part of Minnesota, the northwestern part of Wisconsin, and throughout the upper peninsula of Wisconsin and in the northern part of the southern peninsula of Michigan. At the present time, spruce in the southern peninsula of Michigan is fairly well depleted. There are probably in the neighborhood of 100,000 cords there that are already available. In the upper peninsula there are various estimates, the average of which places the stand at nearly 2,000,000 cords, or more nearly 1,600,000, and the estimate for the whole state is placed at about 1,800,000 cords.

"Spruce in Wisconsin originally was not as extensive as in either Michigan or Minnesota. That has been reduced to about 600,000 cords, as far as we know at the present time. In Minnesota, spruce stands are in much better condition; there have been several estimates given which place the stand between 3,500,000 and 4,000,000 or 4,500,000 cords, averaging about 4,000,000 cords for the state. This spruce occurs in the northeastern forest area, the heavy forest area of the state.

"Hemlock, which has become of great importance to the pulp and paper industry of the lake states, came into demand in the industry after the stands had been gone over, or largely culled, by the lumber industry; not all the stands were culled, but some stands were left unculled, although the big demand had been for lumber previously. Hemlock occurs in Michigan and Wisconsin. That which occurs in Minnesota is rather scattered and of no commercial value. The stands in Michigan and Wisconsin are placed at 36,000,000 cords, and are segregated by states as follows: Wisconsin, 13,000,000 cords; Michigan, 21,000,000 cords, the bulk of it being in Michigan. Hemlock stands are largely held, as far as I was able to gather, by the lumber industry, and I have a table which shows that only between ten and fifteen per cent of it will be available through ownership and bought from the farmers and various pulp-wood contractors.

PULPWOOD SUPPLIES OF THE LAKE STATES

Pulpwood Supplies of the Lake States

Species	Minnesota Cords	Wisconsin Cords	Michigan Cords	Total Cords	Per Cent Available to Industry
Spruce	4,000,000	600,000	1,800,000	6,400,000	70-85%
Hemlock	.....	13,000,000	21,200,000	34,200,000	10-15%
Balsam fir	.....	.....	.....	3,400,000	80-90%
Poplar	10,000,000	4,000,000	6,000,000	20,000,000	60-80%
Jack pine	10,000,000	2,000,000	1,500,000	13,500,000	40-50%
Tamarack	3,500,000	1,100,000	2,000,000	6,000,000	40-50%
Beech, Birch, Maple	.....	.....	.....	72,152,000	2- 5%
	27,500,000	20,700,000	32,500,000	156,252,000	

"Popple is scattered more or less throughout the lake states. It is one of the temporary species that come in after an area has been cut and burned over. The mature popple is rather scattered and confined mostly to the flats in Minnesota. Several estimates covering the stands of popple have been made, but the one in which the greatest reliance is placed puts the stand at about 20,000,000 cords, one-half of which is in Minnesota. The rest is scattered throughout Wisconsin in both the southern and the northern peninsulas of Michigan. A good share of this is not available, that is, through growing conditions it is too scattered to pay for logging.

Jack Pine

"Jack pine is not at the present time very important in the pulp and paper industry. However, Jack pine stands in the lake states preserves which the industry can rely on after the spruce is gone, or has been depleted so that it can't be obtained in sufficient quantities, are found mostly in the northern peninsula of Michigan. That which grows in the southern peninsula is more or less of the apple tree variety, although there are some very good stands; but those in the northern peninsula vary from unmerchantable to those containing between thirty and forty cords to the acre. The estimate for the state is placed at 1,500,000 cords.

"In Wisconsin, Jack pine is confined almost solely, that is, from a merchantable point of view, to Bayfield, Douglas, Burnett and Washburn counties, where it is estimated there is a stand of about a million and a half cords. In the rest of the state there are scattered stands which, as a rough estimate, are placed at 500,000 cords. In Minnesota there is an abundance of Jack pine occurring throughout the timber sections of the northeastern part. The present estimates place this stand at about 10,000,000 cords.

"The use of Jack pine at the present time in other industries is not very great. It is being used more as time goes on and other species are found to be more difficult to obtain.

"The stands of tamarack, which has been used to some extent, especially to go into the wrapping and board, are in a rather bad condition. The stands, however, will be of use for from twelve to fifteen years, so I have gathered. In Minnesota there are supposed to be in the neighborhood of 3,500,000 cords, which is a little over the Wisconsin stands, which amount to only a little over a million cords, and in Michigan, 2,000,000 cords, between forty and fifty per cent of which is available.

"The hardwood situation for the pulp and paper industry is not important because there are very few mills, in fact, practically no mills in the lake states, interested in hardwoods. However, the stands of hardwoods as given are in the neighborhood of 72,000,000 cords. This presents an opportunity for use, at any rate, especially in mills which are able to use the waste products, slabs and so forth, from saw mills.

"These estimates are merely averages of opinions based on estimates that have been made on smaller areas, for instance, some certain counties, and we would welcome a discussion on these estimates."

Address by John D. Rue

In discussing the use of Jack pine as a suitable pulpwood, John D. Rue, in charge of the pulp and paper section of the Forest Products Laboratory, Madison, Wis., spoke as follows:

"I am afraid what I would have to say on Jack pine would have very little bearing on the soda process, because the soda process would be applicable only to pulp that could be easily bleached, and it is well known that all pulp prepared from coniferous trees is difficult to bleach.

"The Forest Products Laboratory is particularly interested in Jack pine as a possibility in substituting for spruce and balsam in the manufacture of sulphite on various grades, particularly news grade, and for those same woods in the manufacture of ground wood pulp.

"It is entirely superfluous to point out to you the fact that many of the mills are now finding themselves in a position where their good wood is a long distance from the mill while they are quite immediately surrounded by large supplies of Jack pine. If that wood could be satisfactorily used for those purposes, it would be a great boon not only to the mills but it would be in the interest of conserving our forests.

"I have no solution to offer for the problem. We are interested in it partly as a reflection of the interest that some of the companies are already showing in the subject and because we are particularly interested in conserving the species which are so rapidly disappearing. If I could offer you a solution it would no longer be a problem. The problem, as I see it in talking casually with various members of the industry, is partly economical and partly a technical problem. The question is, have we come to the point where there is a sufficient differential between the price of the good woods and Jack pine to overcome the general prejudice of the manufacturer or the pulp maker to warrant him to go to the extra trouble and expense which would be necessary to use it. Furthermore, even though that differential has been reached, have you arrived technically at a point where we can handle it in the mills? There is a big difference of opinion among manufacturers at the present time on that subject. Some will say that it cannot be; others are so confident that they can use it that they are filling their yards to some extent with that species now.

"At the risk of taking too much of your time, I am going to offer a word of suggestion as a possible method of studying the problem and driving an entering wedge. In the first place, I feel that it might be worth while to make a very thorough survey of the industry by letter and by personal visit to find out just how far the subject has been carried in the different mills and how far they would be willing to pool their information and their findings on a large project of studying the applicability of this particular species. At the same time, it would be possible to find out just what are the particular difficulties met with in the utilization of Jack pine.

"I think we may enumerate three things as vital at the present time. One is the fact that the pulp is a little off color; that in so far as it can be prepared by the sulphite process at the present time, it is rather shivy and gives a large amount of screenings. Perhaps the largest difficulty being that it affords pitch and pitch troubles in the manufacturing process throughout. That applies to both the sulphite and ground wood pulps. As far as the color is concerned, I feel that, perhaps, that is the least troublesome, which seems to be so indicated by those who have considered it. As far as the large amount of screenings is concerned, I believe it is not an insurmountable difficulty and that a certain amount of experimentation would probably solve that trouble to a point where the wood could be economically used.

"It seems that there are two possible ways of attacking the pitch problem. One would be to attempt to coagulate the pitch and the resin and carry it out under controlled condition and get your coagulated pitch balls at points where you could remove them and leave the system then free. The other is to

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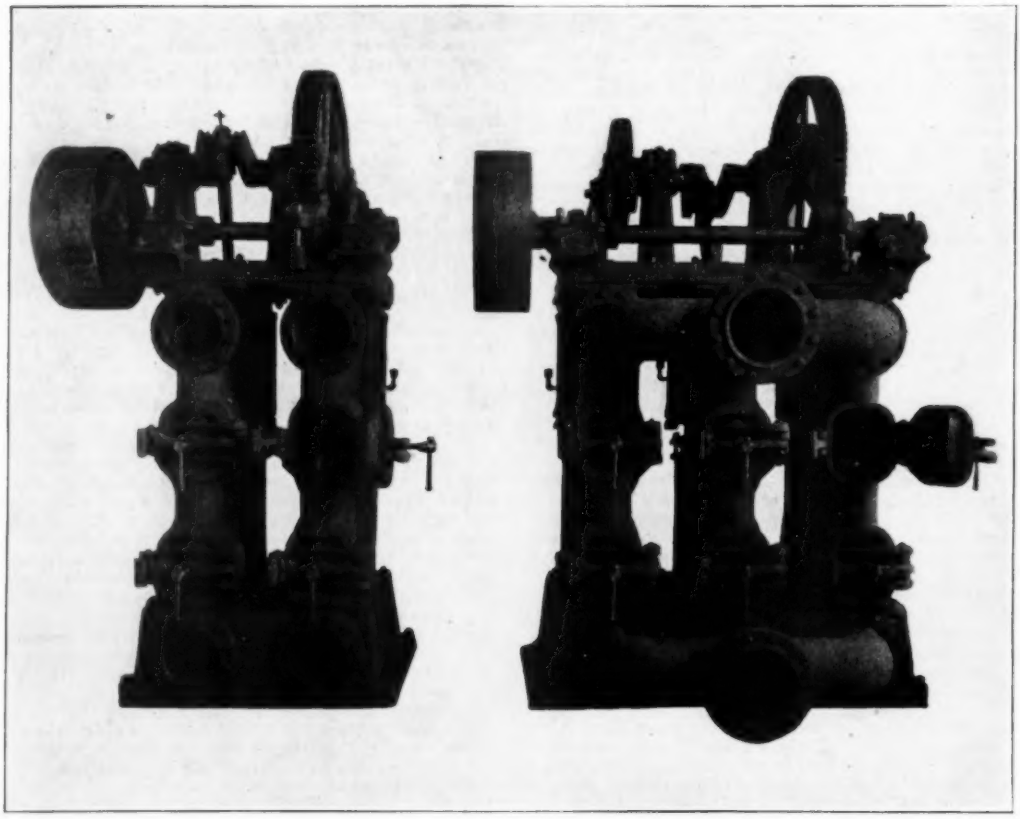

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disseminate the resin material in the course of the process, when it gives no more trouble than size when you put it in the beater. It has been possible to so emulsify pitch or ordinary tar with clay as to make a water-proof paint which is applied with a brush the same as you do whitewash. On that same principle, why wouldn't it be possible to use some such material, perhaps a finely divided clay somewhere in the process, under some definite control conditions, so as to maintain that pitch in workable condition.

"Those are only suggestions. I have never tried them. They are worthy of trying. What I have to offer is that the Forest Products Laboratory, its staff and equipment, is at the service of the industry in the solution of these problems; with this one proviso: that unfortunately Congress gives us funds which are allocated to certain definite projects. Money for such a project as this is not at present available, because all the moneys we have are allocated to projects now under way. We would be very glad, however, to co-ordinate any efforts which the industry desires to make and to finance, and to offer our facilities in connection with that work."

The Salesmen's Association Meeting

That the Salesmen's Association of the Paper Industry has come to be recognized as a real, worth-while organization in the activities of the American Paper and Pulp Association was proven at the Second Semi-Annual Meeting of the Association, held at the Drake Hotel, Chicago, on Tuesday, November 1, 1921, when fourteen new members signed application cards and were admitted to membership. The membership of this very young association now consists of nearly two hundred, live, active salesmen who hold frequent sectional meetings throughout the East and Middle West, and thereby keep themselves informed on general business conditions and help each other by the exchanging of ideas and information.

President H. H. Reynolds called the meeting to order promptly at the appointed time and in his opening address went over the developments of the past six months. Particular attention was given to describing the intent and purposes of the new monthly bulletin now being issued by the association. The belief was expressed that the information published each month in this bulletin would keep the members posted on general business conditions and thereby enable them to more effectually serve their customers.

Secretary Hugh P. Baker summarized the minutes of the annual meeting in April and subsequent meetings of the executive committee. Attention was called to two problems now before the executive committee, that of deciding who shall be eligible to membership in the association and the matter of establishing a registration bureau, whereby salesmen and the mills can be brought together in the matters of employment. Both of these subjects brought out considerable discussion and were referred back to the executive committee with full power to act and report at the next annual meeting.

Reverend George Craig Stewart, D. D., chaplain of the Salesmen's Association then gave an inspiring address on the ideals of the association, wherein he related the following story as the subject of his talk:

"A little child wrote to a grown person, and at the end of the letter, the child wrote, 'I hope that you will live all your life.' The person reading the letter said, 'Huh! how absurd, "I hope you will live all your life."' And then, after thinking of it, he said, 'Why, that is one of the greatest good wishes that I have ever received—to live *all* my life.'

"You realize," said Dr. Stewart, "that the average person that one meets in the street is living but a little fraction of his life, and leaving the great fields and areas of mind and soul untapped, unexploited, while he gets into a rut and goes on leading a little bit of his life."

He then went on to describe in his eloquent manner the properties to look after in living one's whole life. "The first duty," said Dr. Stewart, "is to realize that cathedrals are not to be compared with this majestic and mysterious temple of the human body which enshrines in its sanctuary the blazing light of God Himself. Men, who wouldn't think of committing sacrilege in an earthly thing, commit all sorts of sacrilege against their bodies by neglect, by bad habits, by failing to take those old-fashioned setting up exercises every morning to keep the abdomen in, the shoulders back and the chest out, and to breath deeply and to live an abundant, strong, forceful, virile, physical life.

"The second thing is the mind. A man may walk around industriously as a salesman, into this place and that, stay up all night and make trains to go through his route, go around forever using a physically fine group of muscles to do his work, but what does it amount to compared with another man who on every call invests all of his mind, all that is

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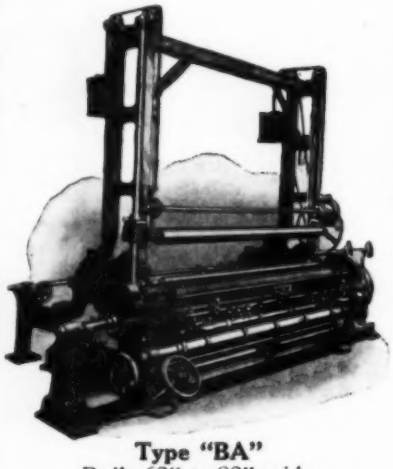

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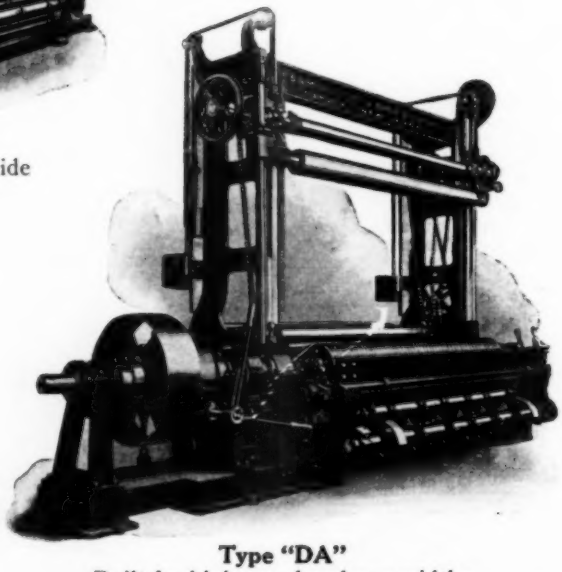

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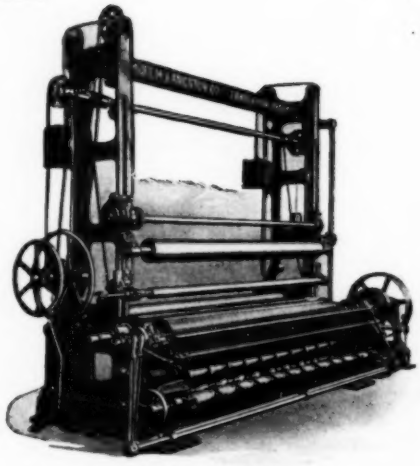

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"The third part of a man's life," said Dr. Stewart, "is that wonderful thing that we call our social life." He spoke of men who were beautifully developed physically and with fine mental developments who weren't worth a tinker's darn as salesmen, because they were of the solitary kind that thought they could go along their own paths and work out their own problems; they had not the gift of mingling with other men.

The fourth point he emphasized was that back of the body, mind and social life is the mysterious, haunting, driving thing called the spirit. The man who has a spiritual life that is vigorous moves everybody and sweeps right through with his cause.

Dr. Stewart's address was followed by short remarks from Mr. Geo. W. Sisson, Jr., after which the session was adjourned for luncheon.

Address by Walter Lichtenstein

Mr. Walter Lichtenstein, of Chicago, opened the afternoon session with an informal but enlightening address on the present financial situation. He spoke in part as follows:

"There are, in the world, roughly, ten billions of dollars in gold that can be used for circulating mediums or as a circulating medium. Of that, about forty per cent is in this country already. The total debt that foreign countries owe to this country amounts to about ten billion dollars, and in addition there are, of course, accumulating large interest charges, and there are unsettled balances of a commercial nature which all told amount to perhaps at present five billion dollars, making a total which other countries owe to this one, of about fifteen billion dollars. Consequently, you can see for yourselves that it is impossible to settle those transactions by means of payment in gold.

"There are only two ways in which international trade balances can be settled; perhaps I might say there are three ways. The one that was employed before the war, of course, was by means of payment of gold from one country to another, either directly or indirectly. The second was by means of goods and services. The third was by means of investment on the part of creditor country in the country which owed it money.

"I have referred to the gold situation, which is steadily becoming worse, and when you reach the matter of goods and services you immediately get into the situation with which we are all familiar—the fact that no country—a protected country like ourselves or France, nor a free trade country like Great Britain—desires to have goods in enormous quantities from other countries just dumped on her shores to destroy her own industries; which is one of the reasons of the great unemployment existing at the present time in the United Kingdom. There you have the situation which is so difficult to solve, that on the one hand many of these countries, notably, of course, Germany, have no gold, or practically no gold, and the only way in which they can pay for those goods which they need and which they need to manufacture in order to sell and make the payments which they owe the rest of the world, is by means of funds which must be obtained by selling their own goods to other countries. As I have said, it is one of the chief causes of the unemployment existing in the United Kingdom and possibly to a lesser extent in this country.

"The fundamental question at the present moment is how Germany will be able to pay without being allowed to sell its goods in the rest of the world. It ought to pay (I think we are all agreed on that) for the damage that it has caused, but the question is not one purely of retribution and what they ought to do, but whether the effect of such payments may not work injury to the countries receiving them, and indirectly to ourselves, greater than any benefit to be derived from such payments.

Tax Question

"You are aware, of course, that there are other questions involved, and since I am speaking not merely on the foreign matters but on the general financial situation, perhaps I may be allowed to touch upon them briefly. One of the greatest difficulties which we are facing is the question of taxes with which Congress at present is occupied. You have seen frequent statements that those who are able to pay ought to be the ones who make the payments, and as a general proposition I suppose we are all agreed that that is so. It sounds very well to say that this surplus earning on the part of corporations and individuals which they cannot use for their own immediate needs and which, if used at all, goes purely for the purpose of luxuries on the part of corporations and individuals, is something that the government might well take, and, of course, that sounds more or less reasonable, but it is a very evident fact that there is a great fallacy involved in that statement. The fact is, as has been

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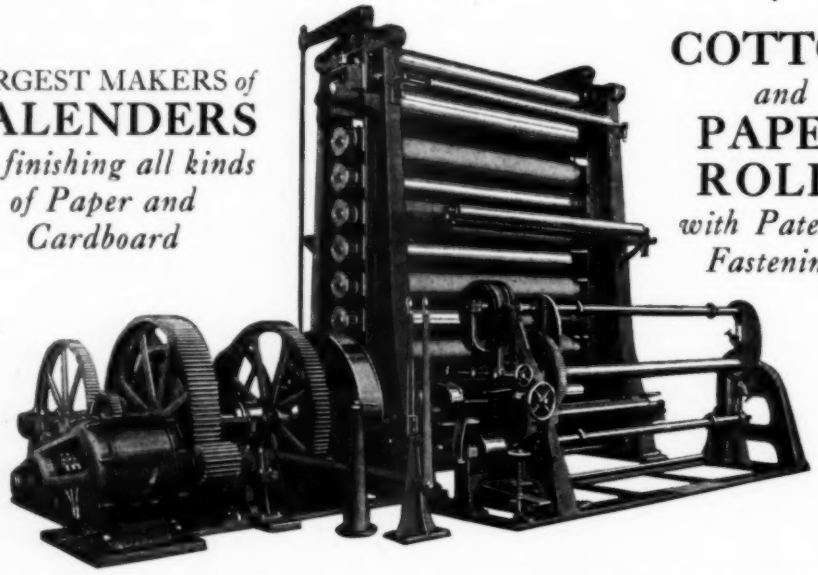

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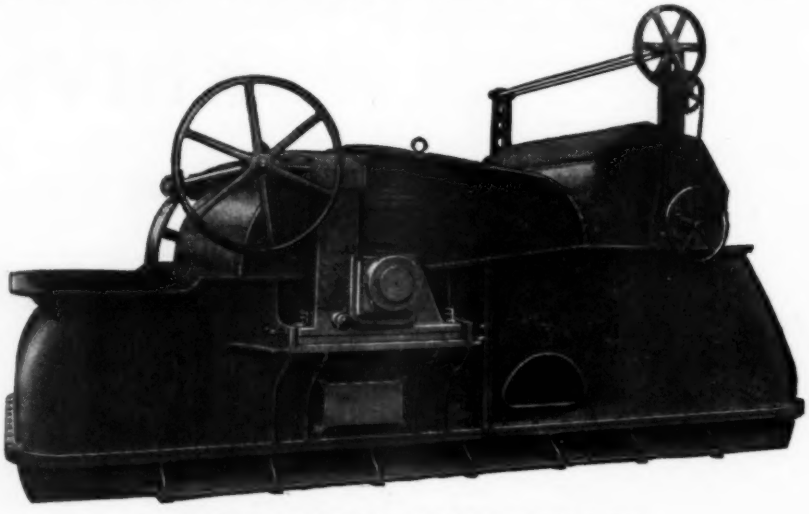

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shown clearly by Professor David Friday of the University of Michigan in a recent work, that the amount of earnings that any one, a share holder in a corporation or an individual, uses of the surplus of the corporation and of his individual earnings, is a very small proportion. It is out of this surplus that is turned back into industry and commerce that the wheels are kept moving and that our laborers are employed and that we expand our industry and commerce. Professor Friday has shown that about eleven per cent of the total earnings of corporations are ever used or have been used for satisfying the individual needs of the community. The rest of it is reinvested in commerce, and business enterprises of various kinds.

"If the taxes are levied on the basis on which they have been levied in recent years, it simply means not that the man of means cuts down his personal expenses, but that the money which he reinvests, the money which he saves for purposes of reinvestment, is cut down; while the government, on the other hand, simply spends the money it takes not for purposes of developing industry but for current expenditures and consumption, and it is permanently lost as far as the development of the country is concerned.

"You can see for yourselves, then, that if we are going to continue to have the burden of taxation under which industry and labor have been suffering, there is not likely to be any great improvement.

"Moreover, there is, as you are all aware, another effect of that system of taxation, and that is that it drives this surplus out of the realm of productive industry and enterprise into investment in tax exempt securities, notably into investment along so-called municipal bonds and similar non-taxable securities. It has been estimated that of this type of securities there is about thirty billion dollars now in existence, and it simply means that municipalities and similar corporations have much larger funds at their disposal than they normally would have or possibly ought to have, and that they are therefore induced to be wasteful and not likely to spend their money as carefully and parsimoniously as they ought to.

Foreign Trade

"To return to the matter of foreign trade, as a result of the situation in the foreign trade to which I have alluded, namely the impossibility of the countries, however much they may need our goods, to take them from us, there is a great falling off of our export trade. The last figures available, which are given in September, showed that the imports were only $180,000,000, and the exports $325,000,000, the latter only $5,000,000 above the export low record of this year; together they constitute but fifty per cent of the joint figures for September, 1920.

"Of course you have heard that our foreign trade after all is not important to this country, and it is true that it is not as important to this country as it is, let us say, to the United Kingdom. The United Kingdom simply cannot exist without foreign trade; it cannot produce enough food to feed its population and it does not produce the raw material for a great many of the goods which it manufactures and from which it lives by selling to other countries. But while that is true, and while it is possibly also true that our foreign trade amounts to only about five to fifteen per cent of the total amount of our trade in the course of a year (it doesn't matter, really, which figure you take because the argument is the same in any case), nevertheless I need not tell a group of business men that the difference between five, ten or fifteen per cent is just the difference between good times and bad times, and that a surplus in any commodity of five per cent or ten per cent or fifteen per cent, whichever figure you care to use, means that that surplus, being a drug on the market, in other words the suppy being greater than the demand in that given commodity, will depress prices unduly and make it unprofitable for you and others to manufacture those goods and to sell them at a profit, and the result is that you shut down your industry and there is greater unemployment, and as a result of that greater unemployment there is less purchasing again.

"It seems to me foolish to say that we are not dependent upon our foreign trade. It is true that if you could conceive a Chinese wall built around the United States, either actual or in the shape of an unduly high protective tariff, practically all the needs of our inhabitants would, in course of time, adjust themselves to the changed situation and produce those goods which we now import and which we had better import because we cannot manufacture and produce them as readily as some other countries can and because we had better devote our energy to producing those things in which we excel. If we in this way gradually curtail our importation and block it entirely and become entirely self-sufficient, in the course of time there will be a readjustment and we shall probably get on a normal basis without Europe or any other country.

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But in the meantime, and a process of that kind I need not tell you is one of very slow development, there will undoubtedly be industrial and social upheavals of all kinds, if not even political upheavals, as the result of unemployment and general disastrous conditions prevailing while such a violent readjustment is taking place. Such a readjustment, as I have said, would take years and years for fulfilment, and it would hardly be desirable because it would mean not merely a readjustment of the present situation but it would mean a readjustment in the case of an individual, because when we say that only five to ten per cent of the total business which we do is foreign business, nevertheless that is not true of all of our business.

"According to the last census, forty-nine per cent of our population is still engaged in agriculture. It used to be much more than that, of course, but by the last census it is seen that from forty-five to forty-nine per cent of the population is still engaged in agriculture and industries immediately connected with it. Consequently, you can have no prosperity in this country unless the farmer is prosperous, and the farmer, of course, cannot be prosperous unless he receives sufficient emolument for his products to enable him to pay the prices which manufacturers and others charge.

"In the case of agriculturists, the proportion of their foreign business as to domestic business is much greater than the general average would seem to indicate. We produce, or can produce, something like eleven million bales of cotton, of which we export about fifty-two per cent or more abroad. Of wheat we export something like thirty-five per cent abroad, or about 300,000,000 bushels. And this list could be very much enlarged.

"What is the result? The result is that the farmer has had difficulty in selling his products abroad, owing to the general foreign situation which I have described—the inability of countries abroad to pay us due to the general conditions under which they are laboring, and the inability to take all that they need from our farmers. The result is that the price of agricultural products has been depressed unduly in relation to the prices of those things which the farmer has to buy. For a while, as you know, the prices of agricultural products are back to pre-war prices, or even lower than pre-war prices. That is not true of any of the other commodities which the farmer needs and for which he has to pay. Of course, he is also laboring under the difficulty of transportation charges which are another item in our general business situation.

Foreign Credits

"Of the three ways of settling international balances, I have mentioned only two. The third is by reinvestment in foreign countries.

"In December of last year three to four hundred of the leading financiers and business men of the country met to launch the establishment of an Edge corporation to be known as the Foreign Trade Finance Corporation, which was to make available for use in the payment of exports from this country, long term credits. There was a good deal of opposition to many of the details of this proposed foreign trade financing corporation. Just criticism was made of many of the provisions, but the fundamental theory was undoubtedly correct. It is the theory or the practice under which Great Britain developed its foreign trade and Germany, prior to the war, began to develop its foreign business. If we wish to do foreign business under present conditions (and it seems to me if we are going to hasten the recovery, we must do everything to promote the development of foreign business), then it will be necessary for us also to follow in the footsteps of Great Britain, Holland, France, Germany, Switzerland and other countries, and make it possible for those countries to import goods on the basis of long term credits.

"I might say in passing that it is by making use of long term credits that European countries enabled our South to get back on its feet after the Civil War. Certainly the situation in our South after the Civil War was probably as bad as a situation could well be; nevertheless, the recovery was fairly quick, and it recovered because in that case chiefly Holland and to a lesser extent Great Britain, loaned very large sums on the basis of long term mortgages on cotton lands in the southeastern part of this country.

"You know also that many of our railroads and many of our mines were built and developed by the investment of foreign capital.

"Now the latest of these schemes, and I refer to it because you may have seen something in the papers about it, is a scheme put forth by the Economic Commission of the League of Nations. I know that to an American audience that has a somewhat ominous sound, but nevertheless it is not connected, in spite of its origin, directly with the League of Nations, though it is to be under the control of it.

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"The fundamental idea of this scheme is simply this: that the governments of the distressed countries of Europe shall list their assets on some gold value basis, this listing to be approved by this International Commission of experts, and these assets are to be set aside distinctly for the purpose of serving as collateral for the issue of long term bonds which the government of the distressed country may lend to the importers in its country, they in turn to give these bonds as collateral for the loans to be derived from the United States and Great Britain and other creditor nations. The idea is not that the individual exporter shall carry this burden; the idea is that there shall be created in this country an Edge corporation which is parallel to similar investment trusts existing already in Switzerland, Holland and Great Britain, and these investment trusts will take this collateral off the hands of the individual merchant in this country and on the basis of these bonds as collateral they will issue debentures themselves which they will sell to the investing public in this country, paying off without recourse to the exporter whatever is due him. In other words, the attempt must be made to make use of the large sums that are available in this country for investment purposes, for the purpose of furthering our foreign trade and our foreign business.

"Whether or not this scheme is carried out, some similar scheme will ultimately be adopted in order to put Europe on its feet. Of course you may say, 'Why bother so much about Europe?' Remember that what we export, as I have tried to indicate, is largely raw material; that is the chief element of the things that we must export, and it is Europe that buys our raw material. South America, Africa, and to a lesser extent the Far East, buy manufactured goods from us, and therefore it is the rehabilitation of Europe that is so essential for the rehabilitation of our own financial situation."

R. S. Kellogg, secretary-treasurer of the News Print Service Bureau, gave an excellent talk on the newsprint situation which appears on another page of this magazine. The rest of the afternoon was then give over to dancing.

Partial Registration

P. M. Allen, Detroit Sulphite Pulp & Paper Co., Detroit, Mich.; John E. Alexander, Nekoosa-Edwards Paper Co., Port Edwards, Wis.; L. M. Alexander, Nekoosa-Edwards Paper Co., Port Edwards, Wis.; Charles T. Andrews, Andrews Bros. Paper Co., Penn Yan, N. Y.; J. V. Baron, Sherman Paper Co., Watertown, N. Y.; H. H. Bishop, Pulp Mfrs.' Assn., New York; Tom W. Cole, Yellow Pine Paper Co., Orangus, Tex.; Holley R. Contine, The Martin Contine Co., Saugerties, N. Y.; C. W. Collins, Cherry River Paper Co., Philadelphia; J. F. Carrigan, N. E. P. Co., 504 Cunard Bldg., Chicago; W. B. Collins, General Paper & Cardage Co., Pittsburgh; Arthur D. Coffin, C. H. Dexter & Sons, Inc., Windsor Locks, Conn.; Chas. H. Coye, C. H. Dexter & Sons, Inc., Windsor Locks, Conn.; F. A. Curtis, Bureau of Standards, Washington, D. C.; A. B. Daniels, L. L. Brown Paper Co., Adams, Mass.; S. P. Davis, Dells Paper & Pulp Co., Eau Claire, Wis.; Charles W. Daw, Carpenter Paper Co., Des Moines, Ia.; D. M. Dixon, Cornell Wood Products Co., Chicago; D. C. Everest, Marathon Paper Mills Co., Rothschild, Wis.; Allan M. Fletcher, Fletcher Paper Co., Alpena, Mich.; Harry Fletcher, Fletcher Paper Co., Alpena, Mich.; W. C. Friedland, Edgewater Paper Co., Menasha, Wis.; G. S. Gaylord, Menasha Ptg. & Carton Co., Menasha, Wis.; W. K. Gerbrick, Central Paper Co., Menasha, Wis.; James A. Greenlee, Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich.; E. M. Garaner, Union Bag & Paper Corp., Woolworth Bldg., New York City; T. L. Gartland, Union Bag & Paper Corp., New York City; J. D. Goldberg, The Hamersley Mfg. Co., 25 Park Place, New York City; G. W. Gilsey, Michigan Paper Co., Plainwell, Mich.; W. Lloyd Heath, H. G. Craig & Co., New York; J. D. Hammill, Hammill-Ross Fiboz Co., Hopewell, Va.; Geo. S. Holmes, Yellow Pine Paper Mill Co., Orange, Tex.; C. W. Hurtubis, Hammermill Paper Co., Erie, Pa.; S. W. Jacobs, Electro Bleaching Gas Co., 18 East 41st St.; F. A. Juckett, Strathmore Paper Co., Mittineague, Mass.; Arthur L. James, Holyoke Card & Paper Co., Springfield; Thomas J. Keenan, 295 W. 19th St., New York; Phillips Kimball, Liberty Paper Co., 203 Lafayette St., New York; R. S. Kellogg, News Print Service Bureau, 342 Madison Ave., New York; J. Kindleberger, Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich.; C. W. Kiefer, Port Huron Sul. & Paper Co., Port Huron, Mich.; Chas. Kimmerman, Falulah Paper Co., 233 Broadway, New York; Otto Kress, Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis.; D. Kuhmarker, Kuhmarker Mfg. Co., 149 W. 24th St., New York; W. W. Langtry, D. C. Paper Mfg. Co., Washington, D. C.; S. G. Leitch, The Gummed Products Co., Troy, Ohio; James Logan, United States Envelope Co., Worcester, Mass.; R. H. Laftman, Bogalusa Paper Co.,

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3 Extra Cylinder Moulds, 30x52", Cheney Bigelow Wks. make.
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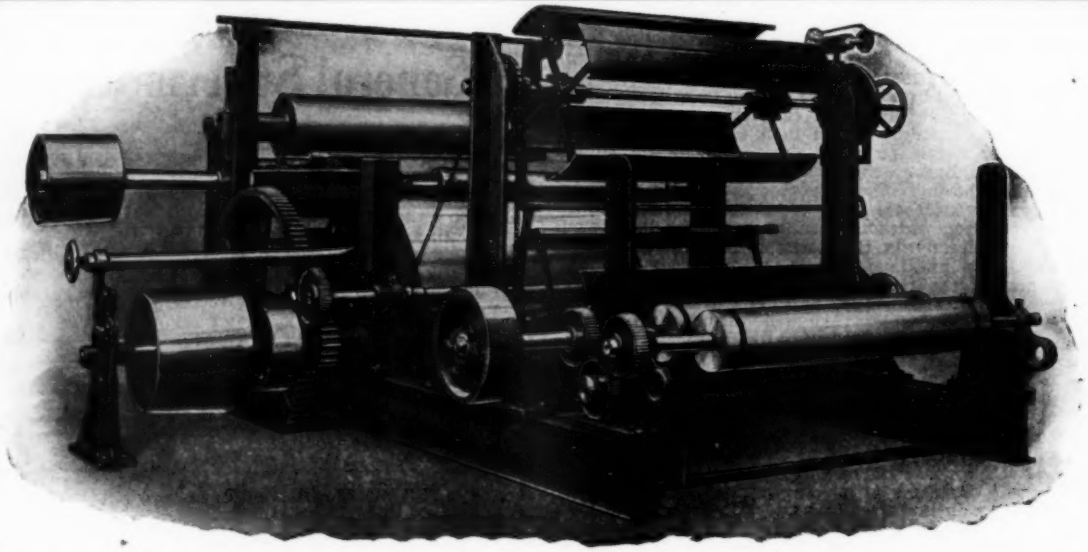

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This Crepe Machine is equipped with our Automatic Collapsing Reels and Drum Winders, allowing operator to run off any number of sheets, then transfer to roll winding, or vice versa. The Crepe Machine is complete without either of the attachments noted above. Drum Winder winds Jumbo Rolls. Automatic Collapsing Reels are for cutting sheets. Any standard width desired with one or more dryers. This combination is a great time, labor and material saver.

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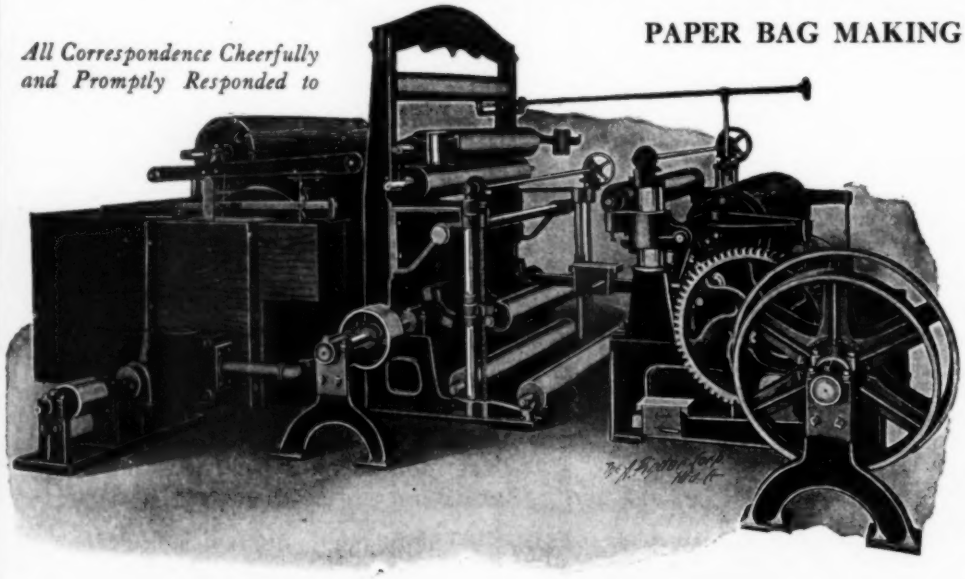

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Cut in Freight Rates

The paper mills of Kalamazoo, Mich., which use enormous quantities of waste papers, have been granted a 10 per cent cut in freight rate on this commodity. The mills demanded a 20 per cent cut, but were finally offered half of the desired amount by the railroads. It is figured that this cut will equal about $5 a car.

The Kalamazoo paper mills use annually about one hundred and fifteen thousand tons of waste paper of all grades. Mills outside of Kalamazoo, but in what is known as the Kalamazoo territory, taking in sections as far as Monroe, Grand Rapids and Watervliet, use another one hundred thousand tons annually, making altogether two hundred and fifteen thousand tons of this material, which is equal to something over fourteen thousand fifteen-ton cars, which will make an annual saving for mills of not far from $75,000. Those who devoted their time and effort to getting this decrease in rates are to be congratulated.

Reports state that the Sutherland Paper Company at Kalamazoo, Mich., whose mill has been running on short time for some months, is now flooded with orders and their plant will operate twenty-four hours a day with three shifts as soon as the necessary help can be secured.

The DeGrasse Paper Company, of Pyrites, St. Lawrence County, N. Y., manufacturers of news print paper and wood pulp, has increased its capitalization from $1,000,000 to $4,000,000, according to notice filed.

Reports state that the new paper mill which is being built at Leesburg, Fla., is nearing completion. This plant is said to have cost $1,000,000, and will manufacture paper from grass grown in that vicinity.

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Top and Bottom Wet Felts for board machines, with all the qualities requisite to insure long life and continuous production.

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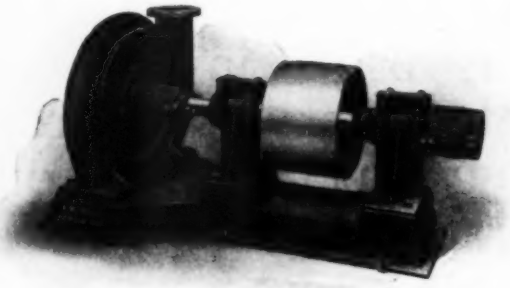

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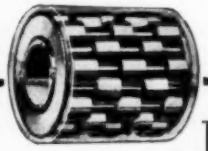

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Journal Bearings must maintain their symmetry and preserve alignment of journals. These superior qualities are built right into

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Correct Design, the Best Material and Accurate Workmanship are the reasons for their **Greater** capacity and Longer Life.

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THE HART ROLLER BEARING CO.

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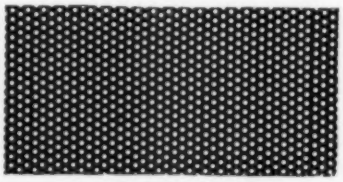
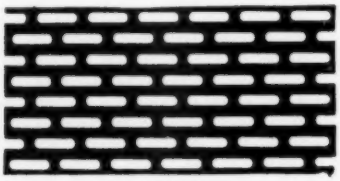
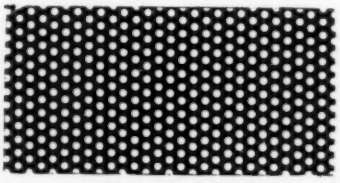
Perforated Metal Screens for Pulp and Paper Mills



.065 inch round



⅛ x ½" Slots



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News Personals

On November 1st, Mr. L. Clifford Anderson will retire from the management of the Nashua Gummed & Coated Paper Company, of Middletown, Ohio, in order to devote himself more closely to his duties as vice president and general manager of the W. B. Oglesby Paper Company, and secretary of the Paul A. Sorg Paper Company, both of Middletown. Mr. Anderson's place at the Nashua Gummed & Coated Paper Company will be filled by Mr. Charles S. Buell, who was formerly the manager of the Chicago offices of the Chandler & Taylor Company, of Indianapolis. Mr. Buel is an engineer, whose specialty is power machinery.

The Becker Paper Corporation, which recently began business at 350 Madison avenue, New York City, announces that Alfred Leeds, formerly vice president of the American Writing Paper Company, and later with the Worthy Paper Company, and widely and favorably known throughout the industry, has been elected president of the company. Mr. Leeds will take an active interest in the new concern and will look after the New England territory, with headquarters at 317 Main street, Springfield, Mass. Carl Becker has been elected vice president of the company and will be in charge of the New York office.

The firm of Edwin Butterworth & Company, well known dealers in and importers of papermakers' supplies, with headquarters in Boston and branch office in New York, has incorporated under Massachusetts laws as E. Butterworth & Company, Inc. Charles H. Wood, of Boston, for 40 years with the firm, is president, and Lewis Jennings, manager of the New York branch and 20 years with the concern, is treasurer. William Dodge and Col. Edgar Smalley, both of Manchester, Eng., and former chief executives of the old firm, are directors of the new corporation.

Leo W. Bowmall, vice president and treasurer of the American Woodpulp Corporation, importers of and dealers in wood pulp and other paper mill supplies of 347 Madison avenue, New York, is shortly to marry Miss Rosalind Clare Nathan, daughter of Mr. and Mrs. Jay P. Nathan, of New York. Mr. Bowmall met his bride-to-be last June on the steamer Aquitania while en route to Europe on one of his periodical visits to the primary pulp markets in Scandinavia.

J. J. Frank, for the past 14 years with the Ancram Paper Mills as general manager and assistant treasurer, has resigned to become associated with F. H. Luning, of 436 Canal street, New York City, taking charge of the new paper department which Mr. Luning has inaugurated in connection with his mill supply business.

C. W. Atkeson, who formerly represented the Continental Paper & Bag Mills in Iowa and Central Illinois, has been transferred to Cincinnati as manager of the Continental division in that city. J. F. Crain, formerly Cincinnati manager, is taking charge of the Texas division with headquarters in Houston.

J. E. Romig, of Dennison, Ohio, formerly advertising manager for the American Paper Products Company of East Liverpool, Ohio, has accepted a position in the same capacity with the Miami Paper Company, and may now be found at his desk with the West Carrollton concern.

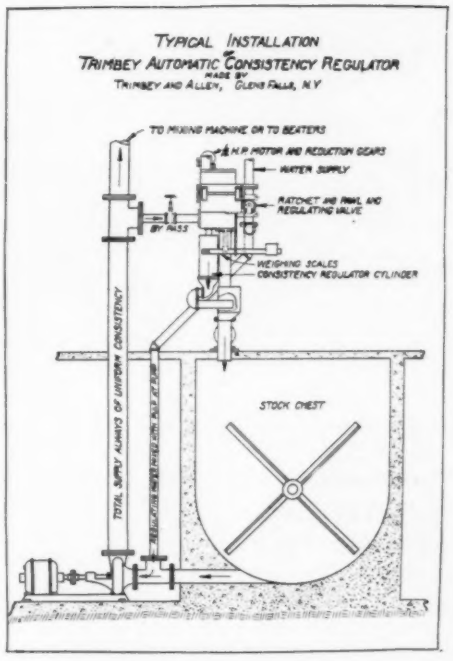
John S. Beach, formerly with Parsons & Whittemore, Inc., of New York, is now associated with R. L. Stevens, Jr., representative in New York of the Rhinelander Paper Company, Rhinelander, Wis., and the Paper Novelty Company, Green Bay, Wis., with offices in the Woolworth Building.

F. G. Marquardt, Inc., dealer in paper and paper mill supplies at 116 West Thirty-second street, New York City, has made an assignment to James J. Boyd, of 280 Broadway, New York. Frederick G. Marquardt is president of the company, which was incorporated in 1917.

Edwin H. Whiting, formerly with the Whiting-Patterson Company, paper jobbers of New York City, is now a member of the sales organization of the International Paper Company.

Jeremiah T. Carey, of Albany, N. Y., who has been president of the International Brotherhood of Paper Makers for the past sixteen years, has been re-elected for another two-year term.

Why Guess at Consistencies?



Install a Trimbey Automatic Consistency Regulator and know them. Know that it is always the same.

It will hold stock at a maximum variation of less than 0.2% consistency as pumped to mixers or beaters.

It removes the main cause of uneven weights.

The Paper Mill Superintendent of Laurentide Company, Ltd., writes:

> *"There is no question but what the control of the consistency of the Groundwood and Sulphite is responsible in a large measure for our successful running at high speed."*

—and the Trimbey is doing it.

Our Line Includes:

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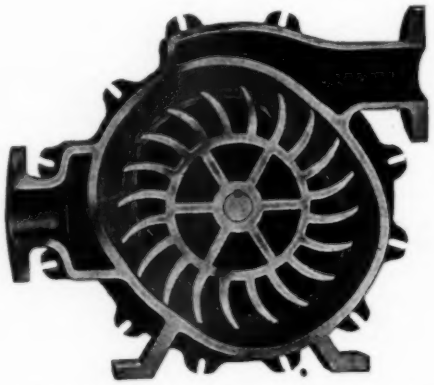
THE HYTOR VACUUM PUMP FOR FLAT BOX SERVICE

Vacuum Produced Absolutely Without Pulsation

No Vibration

Saves Wires



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The Nash Engineering Co.
WILSON POINT ROAD
SOUTH NORWALK, CONN.

New England Representative
G. H. GLEASON
141 Milk St.,
Boston, Mass.

The Above Gear Ratio is 65 to 1.

FOOTE SPUR GEAR SPEED REDUCERS AND WORM GEAR REDUCERS

THE BEST BY TEST

Foote Speed Transformers are mechanically correct, hence operate most efficiently and cost a minimum for operation and maintenance.

Compare the mechanical features of **Foote Speed Transformers** with all others, and you will be convinced just as have such companies as the Pullman Company, Chain Belt Company, Union Draft Gear Company, Riverside Portland Cement Company, E. I. Du Pont de Nemours & Company, Firestone Rubber & Tire Company and many others who choose only after close investigation and rigid tests.

FOOTE BROS. GEAR AND MACHINE COMPANY

Manufacturers of Bakelite and Rawhide Pinions and Cut Gears of All Kinds—Send for Catalog

250-260 N. Curtis Street **Chicago, U. S. A.**

Dumped Foreign Paper Ruled Against by Government

The first specific ruling that paper is being dumped in the United States in contravention of the anti-dumping statute has been made by the Secretary of the Treasury at Washington, the type of paper involved being goat skin parchment. The decision is not only the first relative to paper importations, but is said to be the first of its kind under the anti-dumping act of 1921 relative to any importations.

The memorandum sent to collectors of customs specifies the product of a certain London manufacturer, (Wiggins, Teape & Company) is signed by the Secretary of the Treasury, and says in part:

"After due investigation I find that the paper making industry in the United States is being, or is likely to be injured by reason of the importation into the United States of goatskin parchment paper, first and second quality, and that such merchandise was sold and is likely to be sold in the United States at less than its fair value.

"For any further description of this particular merchandise, appraising officers will communicate with the Comparative Valuation Reports Bureau at New York, where samples are on file."

The Pulp Industry of Pennsylvania

The Bureau of Research of the State Department of Forestry, Pennsylvania, has just completed an initial survey of the pulp industry of the state. The capital investment is stated as $50,000,000, with average annual value of production placed at $60,000,000. The industry is giving employment to 7,144 persons, with total annual wages of $12,500,000, or an average yearly wage of $1,750. In connection with the survey, it is shown that a large amount of wood is imported annually from other states. Very little of Pennsylvania pulp, it is set forth, is utilized for newsprint manufacture.

The National Aniline & Chemical Co., of New York, has recently sent out copies of their house organ, Dyestuffs, for November. This is an issue devoted largely to one of the textile expositions, and the front cover is made up of various colors to imitate different kinds of textiles. This company does a large business with the textile mills, as well as with the paper manufacturers.

John Matthews, prominently identified with the export paper business for a number of years, has associated himself with Parsons & Whittemore, Inc., commencing October 17. Mr. Matthews' experience in the export paper trade is well known and his association with Parsons & Whittemore should further strengthen their world-wide sales organization.

Gibbs-Brower Company, of New York, has just organized a new department known as an engineering department, which will investigate any problem of manufacturing or machinery which manufacturers may wish to have a report on. They will invent, design or build suitable equipment to suit most any service.

William H. Parsons, president of Parsons & Whittemore, Inc., sailed from New York on the Munson Line's new steamer "Southern Cross" on October 1 for Rio de Janeiro, Brazil. Mr. Parsons expects to visit the River Plate countries as well as Brazil.

Atterbury Bros., inc., importers of and dealers in various kinds of papermakers' supplies, of 145 Nassau street, New York City, have increased their capital stock from $250,000 to $500,000 to provide for contemplated expansion.

The Lakewood Engineering Company, Cleveland, Ohio, has moved its Philadelphia offices from the Widener building to the Franklin Trust building.

The Chain Belt Co., Milwaukee, Wis., has opened offices at 735 Ellicott Square, Buffalo, and has appointed T. E. Crocker as district manager for that territory.

Robert L. Ramsey has resigned as director of sales promomotion, publicity and advertising for the American Writing Paper Company.

The Monroe Paper Products Co. has started operations in their mammoth new mill at Monroe, Mich. This is said to be one of the best board mills in the state.

Our Best Labor-Saving Device

Writing us recently the president of the Kalamazoo Vegetable Parchment Co. said, "We appreciate very much the receipt of your catalog, as it gives us a good many ideas which we will undoubtedly incorporate into our new mill.

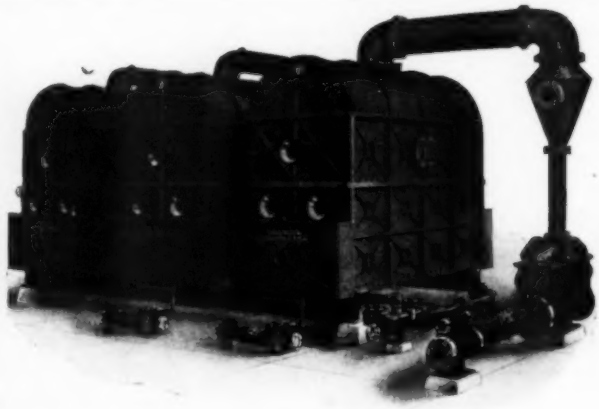
"We are mighty glad to know that you make other things beside locomotive cranes, one of which we purchased from you some years ago, and which we have found in every respect the best labor-saving device that we have about our entire plant."

If you are interested in the handling of materials we want to remind you that Brownhoist is also interested in this subject. Over 40 years of engineering and crane building experience can be yours on any handling subject. And perhaps we can give you some valuable information, as we did the above company.

The Brown Hoisting Machinery Co.
Cleveland, Ohio

Branch Offices, New York, Pittsburgh, Chicago, San Francisco and New Orleans

BROWNHOIST



Yesterday's Waste Is Today's Money

The materials that used to be thrown away are being saved today. As the natural resources become more difficult and costly to work, methods are devised for reclaiming materials from what has heretofore been considered waste.

Can you afford to postpone this matter any longer? We have a complete line to offer for pulp mills, consisting of—

Evaporators	*Smelters*	*Heaters*
Digesters	*Leaching Batteries*	*Causticizers*
Diffusers	*Incinerators*	*Disc Evaporators*

Over **100** *Installations in the United States and Canada*

SWENSON EVAPORATOR CO.

Main Office
945 Monadnock Block, Chicago

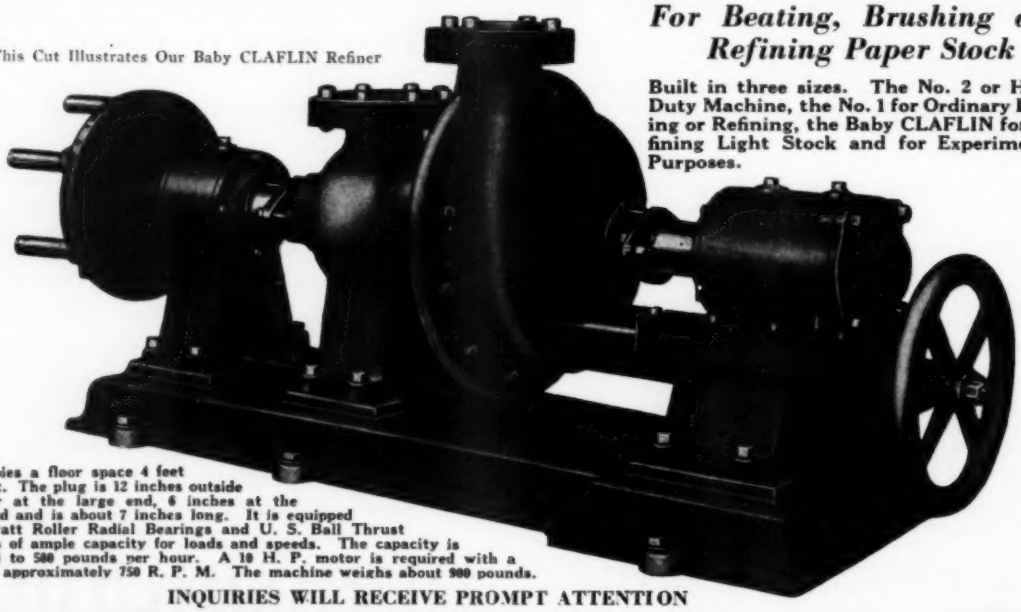
Eastern Offices
519 Widener Bldg., Philadelphia
30 Church St., New York
Cable Address, "Evaporator Chicago," Western Union Code

Works
Angola, Indiana Harvey, Illinois
Auburn, Indiana Joliet, Illinois

USE CLAFLIN CONTINUOUS BEATERS

For Beating, Brushing and Refining Paper Stock

This Cut Illustrates Our Baby CLAFLIN Refiner



Built in three sizes. The No. 2 or Heavy Duty Machine, the No. 1 for Ordinary Beating or Refining, the Baby CLAFLIN for Refining Light Stock and for Experimental Purposes.

It occupies a floor space 4 feet by 2 feet. The plug is 12 inches outside diameter at the large end, 6 inches at the small end and is about 7 inches long. It is equipped with Hyatt Roller Radial Bearings and U. S. Ball Thrust Bearings of ample capacity for loads and speeds. The capacity is from 350 to 500 pounds per hour. A 10 H. P. motor is required with a speed of approximately 750 R. P. M. The machine weighs about 900 pounds.

INQUIRIES WILL RECEIVE PROMPT ATTENTION

The Claflin Engineering Co., Lancaster, Ohio

THE CANADIAN FAIRBANKS-MORSE COMPANY, LTD., MONTREAL, QUEBEC—*Our Canadian Agents*

M. E. Battles Retires

M. E. Battles has formally retired as treasurer and general manager of the Union Paper & Twine Company, Cleveland, Ohio. His change to private life will be a very distinct source of regret to his many friends and acquaintances in the paper business. He will, however, retain his position as one of the directors of the company.

Mr. Battles started the Union Paper & Twine Company in Cleveland in 1891, having at that time associated with him R. Roesch and William Richards, and to the initiative of these three men was due the prosperity enjoyed from its inception.

The growth of the company has been very steady, from a small house selling only wrapping paper to one of its present size distributing all classes of printing, writing, wrapping, building and other papers.

In 1912 the company's large warehouse on St. Clair avenue burned and the present warehouse at Canal road was acquired immediately after. This warehouse now contains not only the wrapping paper stock but also the manufacturing and converting departments of the company.

Death of John G. Luke

In the death of John G. Luke, for many years president of the West Virginia Pulp & Paper Company, the paper industry has lost one of its biggest and best men. He was one of the pioneers in the book paper manufacturing business, and came from a family of papermakers, as both his father and grandfather were engaged in the same occupation.

Early in life, Mr. Luke, like many other successful men, was thrown upon his own resources. His first work in the paper industry was at the age of sixteen, when he was employed in the mill of Jessup & Moore Paper Company at Rockland, Del., of which his father was the superintendent. Later he himself became superintendent of the paper mill of the then Mead & Nixon Company, of Dayton, Ohio. His advancement in the industry was rapid, and on account of his great ability he soon rose to be the head of one of the largest paper manufacturing companies in the world. It cannot be otherwise that a man of such sterling worth and great ability will be greatly missed in this industry.

Hanna Paper Co. and St. Regis Paper Co. Merge

An event of considerable importance in the paper industry was the recent merger of the Hanna Paper Company with the St. Regis Paper Company, both of Watertown, N. Y.

The Hanna brothers held a controlling interest in the Hanna Paper Corporation, which a few years ago took over the Remington Paper & Power Company. They have now sold their common stock to the principal owners of the St. Regis Paper Company, but have retained their preferred stock.

The common stock held by the Hanna brothers in the Champion Paper Company mill at Carthage is not involved in this deal, nor the common stock held by others in the Hanna Paper Corporation.

It has been announced that the two companies will be run as two distinct corporations, but the management of the St. Regis Company will have charge over the other plant.

A Big Order for Paper Machines

One of the largest single orders for paper machines ever filled in this country is now being completed by Bagley & Sewall Company, of Watertown, N. Y., for the St. Maurice Lumber Company's new news print mill at Three Rivers, Quebec, Canada. Practically all of one of these machines has already been shipped and work of setting it up has already started. All of these machines are of high speed type with electrical drives and will make a sheet of paper 164 inches wide.

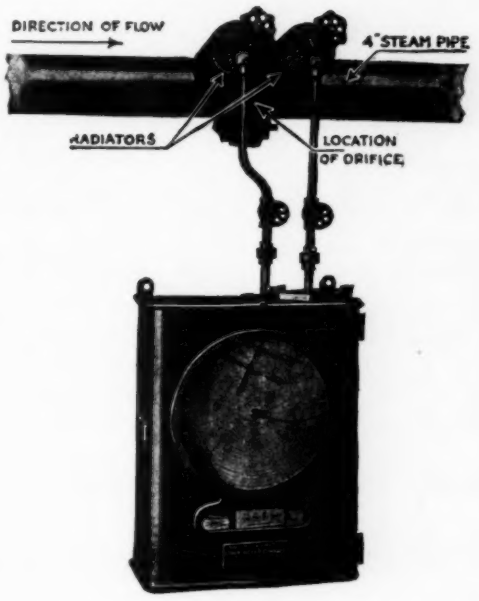
Reports say that all of the plants of the Hinde & Dauch Paper Co., with headquarters at Sandusky, Ohio, and mills at many different points, are now running on a normal basis, which is another indication that conditions are fast improving in this industry.

Franklin E. Bragg, formerly vice-president of the Orono Pulp & Paper Co., Orono, Me., has been elected president of the company, to succeed his father, the late Charles F. Bragg, who had served as president of this company since 1906.

The name of the Kingston Paper Company, of Little Falls, N. Y., has been changed to the Niagara Felt and Paper Company. The concern manufactures roofing and other grades of paper.

Storm & Bull, paper merchants of New York City, have reduced their capital stock from $200,000 to $10,000.

Bailey Fluid Meter



PRACTICAL — ACCURATE

This shows the Bailey Fluid Meter complete for the measurement of steam. It consists of the Monel metal orifice installed between a pair of flanges, radiators and valves tapped into the pipe on the inlet and outlet sides of the orifice and pipes connecting these to the recorder.

Bailey Fluid Meters are easily and cheaply installed as changes in piping are not required and the accuracy is guaranteed.

They are the most practical and satisfactory meters for recording and integrating the flow of steam to turbines, digesters, paper machines and other processes. Steam can be measured at any pressure and temperature, exhaust steam included.

Either pressure or temperature recorders, or both, may be added to record on the same chart as the rate of flow.

Our engineering department is ready to suggest the proper equipment for your service.

The BAILEY METER COMPANY
2023 East 46th Street, CLEVELAND, OHIO

E. J. KELLER COMPANY
INCORPORATED
200 FIFTH AVENUE
NEW YORK

FOREIGN AND DOMESTIC
PAPER MAKERS' SUPPLIES
CHEMICAL AND MECHANICAL PULPS
COTTON, JUTE AND FLAX WASTES
EAST INDIA MERCHANDISE

"TYLER"
CORDUROY CLOTH
for SAVEALLS
GROUND WOOD WET MACHINES
WATER FILTERS
SULPHITE WET MACHINES

Tyler Corduroy Cloth, for use in the paper making industry, has four distinct advantages over other types of screen, namely:

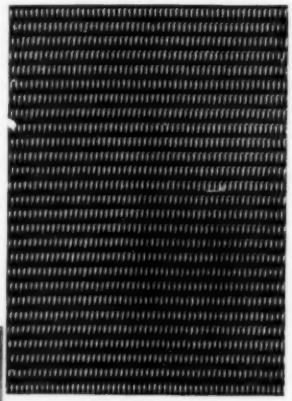
1—It eliminates the necessity of using backing wires.
2—It gives much longer life than fine face wire.
3—There is no chance for stock to collect between the two covers which occurs where a fine wire and a backing wire are used.
4—Eliminating the backing wire, saves considerable time in applying the cloth to the machine.

Tyler Corduroy Cloth is made from phosphor bronze, monel, or nickel wire, and is carried in stock in all widths up to and including 150 inches.

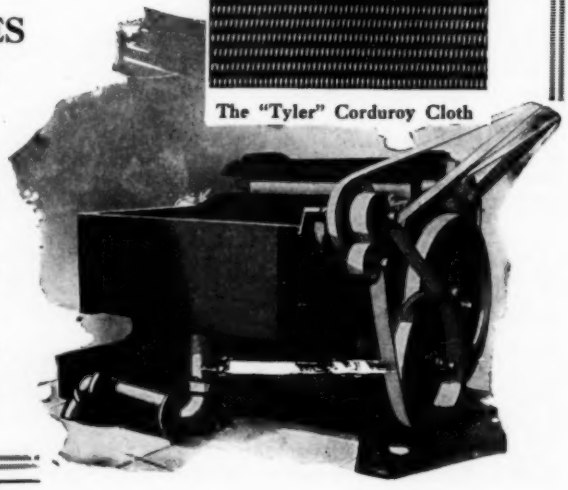
Samples will be sent upon request.

Also Manufacture Fourdrinier Wires, Cylinder Faces, Washer Wires, Backing Wires

THE W. S. TYLER COMPANY
CLEVELAND, OHIO



The "Tyler" Corduroy Cloth



Foreign Trade Opportunities

A mercantile firm in Norway desires to secure an agency from manufacturers for the sale of sulphur and requisites and supplies used by wood pulp, paper and cellulose mills. Quotations should be given c. i. f. Norwegian port. Payment to be made through banks in Norway and New York. References. For further data those interested should communicate with the Bureau of Foreign and Domestic Commerce, Washington, D. C., referring to Inquiry No. 85.

The Norwegian representative of an American firm now in the United States desires to be placed in touch with manufacturers with a view to securing an agency for the sale of rosin of quality f. g. m. as used by papermakers. Quotations should be given c. i. f. Norwegian port. Payment to be made through banks in Norway and New York. References. For further data those interested should communicate with the Bureau of Foreign and Domestic Commerce, Washington, D. C., referring to Inquiry No. 139.

The American representatives of a mercantile firm in Australia desire to purchase and secure an agency for the sale of paper. Purchases to be paid for in cash. Reference. For further data those interested should communicate with the Bureau of Foreign and Domestic Commerce, Washington, D. C., referring to Inquiry No. 112.

Newsprint Output Grows

The volume of newsprint produced in Canada in September was larger than in the corresponding month last year, according to the Canadian Pulp and Paper Association. The movement has been upward since the drastic decline of April, with the exception of June. A summary for six months shows $33,379,508 of paper produced, as compared with $43,025,764 in 1920 and $27,119,246 in 1919; pulp, $15,804,159, as compared with $44,217,711 and $16,626,726, and a total of $49,182,667 as compared with $87,243,476 in 1920 and $43,745,972 in 1919. Pulpwood exports were $457,027 for September, a decline of $7,033,667 as compared with September, 1920, but an increase of $51,636 over August. The United States received 49,608 cords, as compared with 151,541 in 1920. Newsprint exports for the month were 1,212,225 cwt., an increase of 11,911 over last year.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912,

Of The Paper Industry, published monthly at Chicago, Illinois, for October, 1921.

State of Illinois, County of Cook—ss.

Before me, a Notary Public, in and for the state and county aforesaid, personally appeared Edward B. Fritz, who, having been duly sworn according to law, deposes and says that he is the Owner and Publisher of The Paper Industry, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Edward B. Fritz, 356 Monadnock Block, Chicago; Editor, A. Scott Dowd, 356 Monadnock Block, Chicago; Managing Editor, A. Scott Dowd, 356 Monadnock Block, Chicago; Business Manager, Edward B. Fritz, 356 Monadnock Block, Chicago.

2. The sole owner is: Edward B. Fritz, 356 Monadnock Block, Chicago, Ill.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

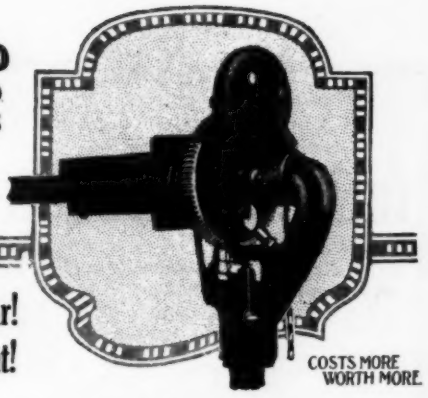
5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is ..... (This information is required from daily publications only.)

Edward B. Fritz,
Publisher, business manager, or owner.

Sworn to and subscribed before me this 8th day of October, 1921.

(SEAL) Roberta Pigott.

(My commission expires January 14, 1922.)



Dollar for dollar the Valv-in-Head Soot Blower is a tremendously better investment than the independent Valve Soot Blower.

Among Valv-in-Head economies are:

1. STEAM FOR OPERATION: Saving of 50 per cent.
2. LABOR FOR OPERATION: Saving of 50 per cent.
3. PIPE, VALVES AND FITTINGS: Saving of 66⅔ per cent.
4. MAINTENANCE: Saving of 25 to 50 per cent.

These savings alone offset any extra first cost of the Valv-in-Head system. Once installed, the new blowers pay for themselves several times over each year.

Now note some of the outstanding mechanical advantages:

5. VALVE DESIGN—time of opening and closing exactly adjusted to soot blower operating conditions, being slower than the standard quick-opening valve and faster than the standard globe valve, thus solving a problem of long standing.
6. VALVE BODY—heavier and stronger than that of high grade valves for equal pressures and temperatures.
7. TIGHTNESS—unless operator makes two trips, to close globe valve, one to shut off line (while valve is hot), and second to tighten valve (after it has cooled and contracted), the globe valve tends to leak as wire drawing and erosion take place. With Valv-in-Head system, valve is tightly closed at all times. Fewer joints and fittings with Valv-in-Head system mean fewer opportunities for leaky lines.
8. CONTROL—steam may be intermittently discharged over two or more arcs in revolution. Arc or arcs of steam jets within boiler invariably cover exact predetermined limits. Speed at which blower element may be revolved is so controlled by reduction gearing as to make improper operation extremely unlikely. Unit provided with visible and audible signal to indicate valve open.

There are dozens of other mechanical points. Why not let us tell you about them?

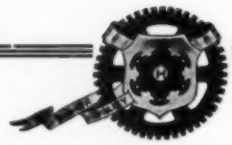
Every boiler needs a mechanical soot blower and you will save money by buying the best. Diamond Valv-in-Head blowers are adapted to all types of water tube boilers. On request our Service Engineer will go over your existing soot blower installation and advise whether it can profitably be replaced with the Diamond Valv-in-Head system.

Ask for Your Copy of Bulletin 297, Describing the New Blower.

DIAMOND POWER SPECIALTY COMPANY
Detroit, Michigan

Diamond

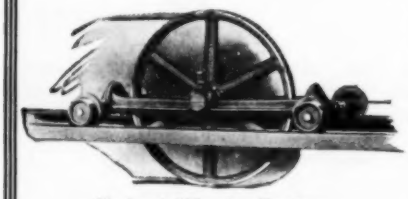
SOOT BLOWERS - SAVE 4 to 8% FUEL



HILL CLUTCH EQUIPMENT

should not be confused with the lighter lines of power transmission machinery as ordinarily carried in stock by supply houses.

We build equipment fitted for the job and not for the shelves.



Horizontal Tension Carriage

Put your transmission problems up to the Hill Clutch Company's engineers. This service is absolutely free and places you under no obligation.

We manufacture a complete line of efficient power transmission machinery, including the well-known Hill Friction Clutch (Smith Type) and Hill Collar Oiling Bearing.

Catalog and Bulletins upon request

THE HILL CLUTCH CO.

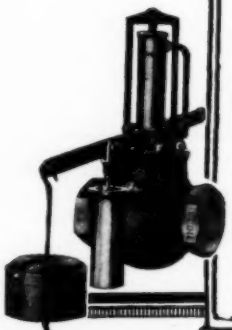
General Office and Plant
Cleveland, Ohio

New York Office
50 Church St.

THE Davis Pressure Regulator shown below is only one of the Davis Valve Specialties. The line includes pressure regulators for steam, air, water or oil, steam traps, balanced valves, float valves and many other steam savers for paper mills.

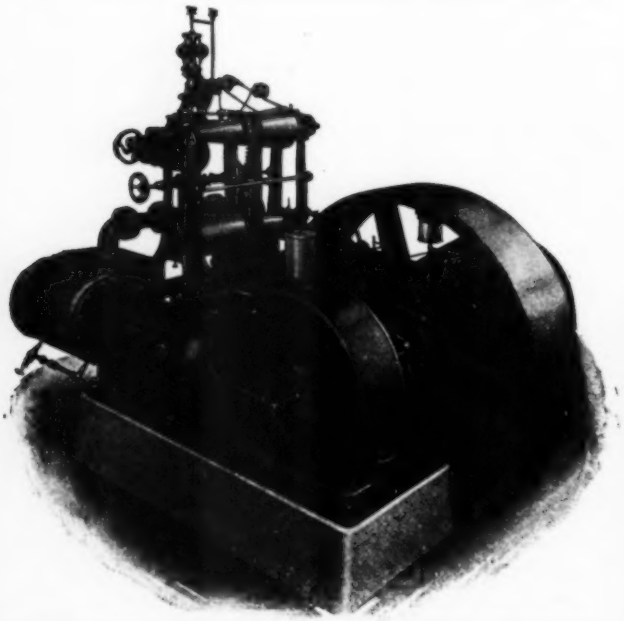
All Davis equipment is simple — dependable — accurate. Almost a half century of trustworthy operation assures that.

All paper mill operators should have the 72-page catalog. Shall we send your copy? Write the G. M. Davis Regulator Co., 414 Milwaukee Avenue, Chicago.



DAVIS VALVE SPECIALTIES

STEAM SAVERS SINCE 1875

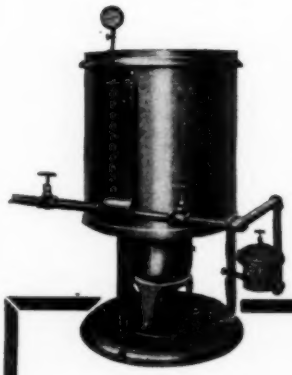


Variable Speed Engine

The engine illustrated above is especially designed to drive paper machines, giving continuous and reliable service. A patented safety device protects your employees and plant.

THE BROWNELL CO., Dayton, Ohio

SEND FOR BULLETIN E-4



The *Bayley* B. T. U.

A Complete, Self-Contained Heating and Ventilating Unit that distributes tempered air evenly throughout the room. It adapts itself readily to permanent or temporary heating requirements, is easily installed, requires no piping except supply and return from source of steam. Simply set on floor where wanted, connect steam and return piping, and wiring to motor and it's ready to run.

Send for Bulletin Today. Dept. B

BAYLEY MANUFACTURING CO.

732 Greenbush, Milwaukee, Wisconsin
1476 Broadway New York, N. Y.

A Wonderful Record

THE following is taken from "Making Paper," the house organ of the Crown-Willamette Paper Co., mills at Camas, Wash., West Lind, Ore., and other points. It is well worth reading and emulating by other paper manufacturers:

"During the month of September the Camas mill made the finest showing in accident prevention that has ever been made in any of our mills employing anywhere near the same number of people.

"With an average of almost 800 people employed, they went the entire 30 days without a single disabling accident and with but three slight accidents.

"When we look back over the records of the last four or five years and see that it was no uncommon thing to have all the way from 20 to 80 accidents each month, the record of last month looks all the more remarkable.

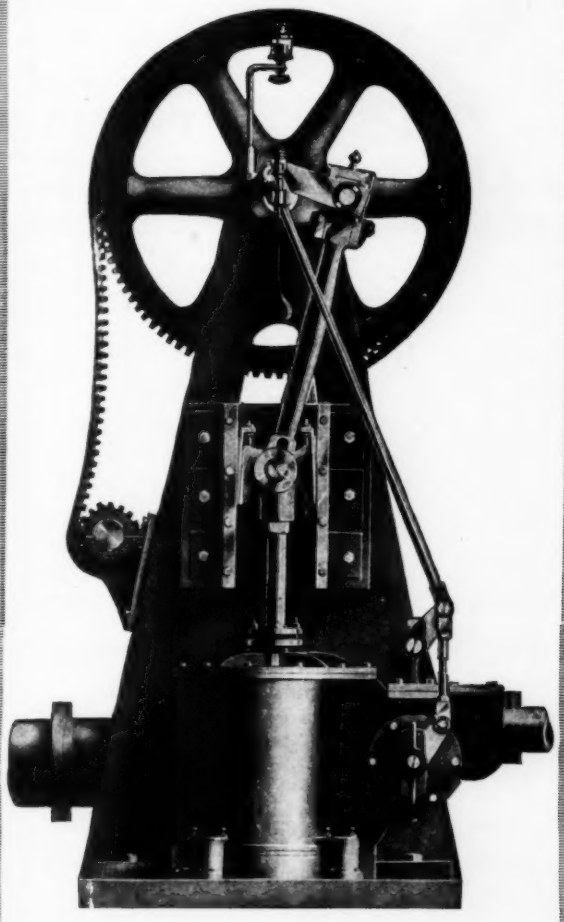
"On another page we are publishing a table, showing all the accidents that have occurred at Camas for the last four years. If you will follow this table carefully you will note that it is in just the last few months that this mill has really got down to cases and shown what they can do.

"During the month of September the West Linn mill had nine lost time, or disabling accidents, which caused a total of 85 lost days or a loss of $338.04 in wages. If the workmen at West Linn were called upon to make up this loss to those that were hurt, it would mean that each one of the 830 people employed would have to dig up about 40 cents each.

"Naturally one would ask what has brought this change about and the natural answer is that men are more careful than they were in former years. But this does not account for all the good showing at Camas. In former years we had safe-guards, we had men that devoted all their time to accident prevention, we had experts who preached safety first at every opportunity, and still the accidents keep happening. The answer does not lay in any one of these, but in the fact that the men themselves have taken an honest interest in the work and to the fact that the mill is clean. To the latter condition is probably due as much credit as any one factor—for the Camas mill is surely clean, not only clean in the aisles and where it will show, but clean in the corners, and men do not get hurt as readily in a clean mill as in a dirty one. There are no loose boards or other trash to stumble over, there are no greasy floors to slip on, no dark corners to hide danger and piles of rubbish to hide a hazard.

"There is a certain amount of glory in having the safest mill. There is also a certain amount of satisfaction in knowing that you have knocked the spots off of any record that West Linn ever made. But for that real honest-to-gosh feeling of satisfaction you have got to know that you won the honors in a clean way in a clean mill."

High Efficiency Vacuum Exhausters



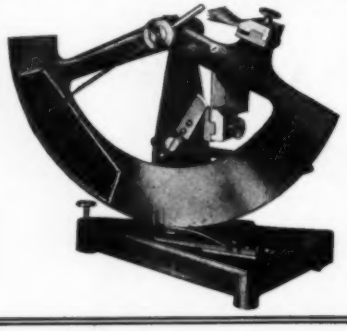
This exhauster is a well designed high efficiency piston displacement machine with extremely low clearance, showing indicator cards closely approximating the ideal for apparatus of this character.

The machine is simple in construction, of few parts which are easily accessible for oiling and adjustment, and is capable of long periods of continuous day and night operation without stopping for adjustment.

Write for further information.

Glamorgan Pipe & Foundry Co.
Lynchburg, Va.

Know the tearing strength of your paper *accurately*



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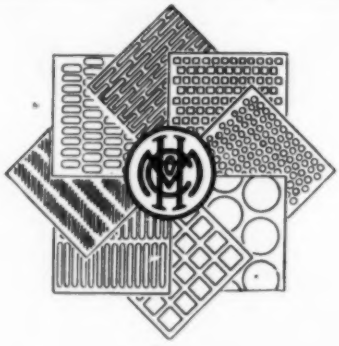

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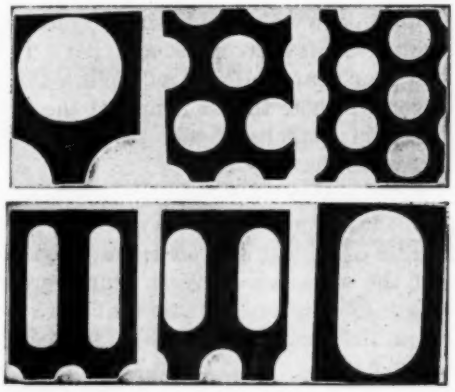

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New England

Boston, Mass., Nov. 1, 1921.

Standardization is becoming quite an important function of executives in the paper field of New England. This applies with equal force to manufacturers and merchants. We note many instances among the larger merchants where instead of advertising tthe addition of new lines of paper, these firms are letting it be known as widely as possible that their watermarks are being reduced in number, the less important eliminated, the best sellers retained and these latter stocked in far larger volume than was possible under the old system of handling an almost unlimited number of brands and watermarks.

Prices in New England are steady on fine papers with many of the real bargains in job lots of m. f. book, bonds and covers, rapidly disappearing. In fact, as the printing business of Boston becomes more active, the job lots on some lines are being entirely cleaned up, job litho for instance is stocked lightly insofar as "bargains" go.

In coarse papers, partly due to the extreme low water in paper mill streams and partly to an improved seasonal demand, the market shows much strength. We look for continued strength in the coarse paper field until mid-winter. Many of the smaller tissue mills, for instance, declare they cannot make tissue profitably at current prices prevailing, and with many of these comparatively small mills running one machine out of three or closing for several days a week because of low water, the cost per pound of all paper produced is correspondingly greater. Last week several large mills withdrew their prices and on the new basis are quoting from $1.00 to $1.15 for No. 1 tissue 20x30. No. 2, 24x26, is quoted at 85c to 90c and Manila tissue about the same figure as No. 2.

In one instance we note that the price of low grade wrappings, including screenings and kraft brown manila, were advanced in price by a New England manufacturer. The outstanding development was the advance to 7c on kraft paper by all the large mills except Claremont. The quotations by the chief New England manufacturer have been advanced on jute twines, and cotton twines also maintain their firmness, both instances of strength being due to the shortage in the jute and cotton crops, respectively.

The newsprint market in Boston is influenced to some extent by imported paper. The Hearst paper has been buying quite a considerable proportion of its necessary supplies from Germany and we are told some of it has been bought as low as 2½c per pound landed at the docks. Newsprint generally in and about Boston is soft in price and though the Canadian paper as well as that of the International Paper Company is 4c spot, news in rolls has been offered on several occasions with more or less freedom at 3¾c per pound.

Paper boards have experienced a period of violent fluctuations since the price advance began some two months ago. At the time we write, some mills are still selling chip board at $35 per ton carrying delivery in New England, while the regular price is $37.50, with some mills who have orders and are therefore not so over-anxious for business quoting $40.

Pulp and Paper Men at Orono Superintendent Meeting

On Saturday, October 29. 1921, twenty-eight superintendents and cost accountants from various paper mills of New England met at the University of Maine, Orono, for an all day joint meeting of the Northeastern Division of the American Pulp and Paper Mill Superintendents' Association and the Northeastern Division of the Cost Association of the Paper Industry.

Superintendents were represented in the larger numbers. F. L. Bush, of Holyoke, Mass., gave an address for the Cost Association. Visitors were shown about the town and over the mills of the Orono and Great Works Companies. At the business meeting of the Superintendents' Association a resolution was drafted and passed strongly urging passage of the Snell Forestry Bill by the National House, the Snell Bill being designed to effect a continuous and adequate supply of timber for all needs. The resolution was signed by the committee on resolutions consisting of B. T. Larrabee, of the S. D. Warren Company; Oscar Ingalls and Fred P. Hall, of the Pejepscot Paper Company, Brunswick; C. F. True, of the Forest Paper Company; William Foley, of the Nekonegan Paper Company.

At the evening session. W. W. Cronkhite, of Schenectady, N. Y., gave a long and interesting lecture on "Power in Pulp and Paper Mills," bringing out forcibly the part played by electrical engineers in the efficient operation of paper mills. Mr. Cronkhite illustrated his talk with a series of stereopticon

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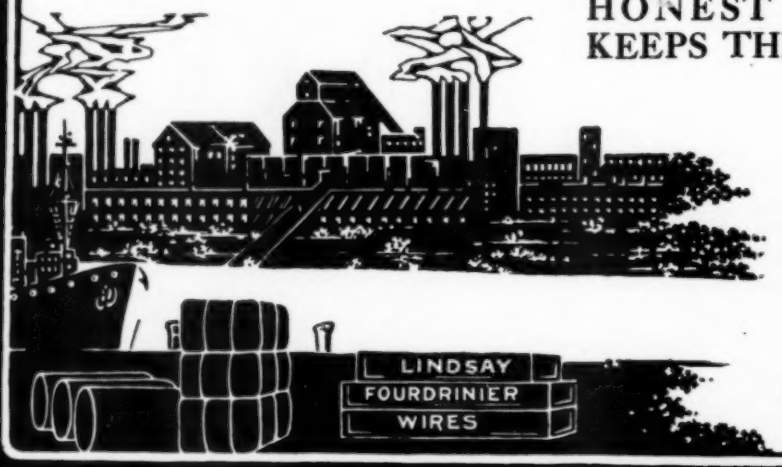

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The Lindsay Wire Weaving Company

Collinwood Sta., Cleveland, Ohio

"Ask any Papermaker"

FOURDRINIER WIRES

Dandy Rolls *Cylinder Molds*

Brass, Copper and Iron Cloth

Bank and Office Railings

WIRE SIGNS

Cheney Bigelow Wire Works

Established 1842 SPRINGFIELD, MASS.

slides showing electrical devices used in the paper industry.

In formal discussion which followed the addresses, it was agreed that business conditions are looking up and that the depression is gradually drifting away. Most of the pulp mills it was brought out in the discussion have on hand an unusually large supply of pulpwood, so that it is not expected that very much wood will be cut this winter. It is not believed that this condition will continue more than one winter, however, and next year should be a banner one in the cutting of timber, and should business merely continue as at present there should be at least a normal cut at that time.

The following members of the two associations were registered: Hebron H. Hackett of the Eastern Manufacturing Company; G. H. Gleason of the Nash Engineering Company, Newtonville, Mass.; Eugene Sullivan of the Orono Pulp and Paper Company; J. J. Sullivan, Eastern Manufacturing Co.; A. R. Larcher, Penobscot Chemical Fibre Company; B. T. Larrabee, of the S. D. Warren Co.; L. P. Parkman of the S. D. Warren Co.; J. A. Harlow of the Penobscot Chemical Fibre Co.; W. V. Wentworth of the Penobscot Chemical Fibre Co.; William Kane of the Eastern Manufacturing Co.; Fred Kirk and Fred Shirley of the Eastern Manufacturing Co.; A. B. Pomeroy, R. R. Knott and J. Hobson of the Eastern Manufacturing Company; P. B. Palmer of the Orono Pulp and Paper Co.; W. T. Libby of the DuPont Co., Boston; H. H. Melcher, A. C. Cloudman and K. E. Terry of the S. D. Warren Co.; K. R. Fox of the Allan Electron Co., and William Foley of the Nekonegan Paper Co.

A new pulp mill is to be constructed at South Gardiner, Maine, by the Pine Tree Pulp Company, organized at Brunswick. The ground has been broken and the concrete foundation is being put in. The officers of the new concern are J. H. Machette, president and treasurer, and Robert K. Eaton and E. W. Wheeler, temporary directors. The building will be one story 126 x 50. The mill will allow for doubling of the capacity with no change of construction. The capacity will be 24 tons in 24 hours at the start.

New England International Mills Show Improvement

Conditions among the mills of the International Paper Company in New England show steady improvement. The Montague mill at Turners Falls was down for more than a week during the past month, or rather it was forced to run on one machine out of three due to repairs to the others. The mill at Franklin, New Hampshire, which like the one at Turners Falls produces no newsprint but operates on specialty papers which are making the International famous in other lines besides news, has been running to capacity. In fact the Company we are told at the Boston sales offices has been forced to look elsewhere to take care of orders which this mill would normally handle. The Company's big mill at Bellows Falls is running one machine at last reports, so we are told. The Rumford, Maine, mill and the one at Livermore Falls, Maine, where about 700 men are employed, are operating to some extent and gradually week by week increasing production. The worst situation exists at the big mill in Berlin, New Hampshire, where riots and armed insurrection against town authorities has been experienced.

Oscar S. Greenleaf, a former paper manufacturer, treasurer and manager of the Holyoke Paper Company until it was absorbed by the American Writing Paper Company, and later lessee of the Springdale Paper Mills in Westfield, died in his home in Springfield, Mass. Mr. Greenleaf was prominent in the civic life of Springfield in addition to his almost lifelong association with paper manufacturers.

About 125 delegates to the Direct Mail Advertising Association convention at Springfield, the week of October 25th, were escorted throughout the paper mill cities of the Connecticut Valley for first hand inspection of the manufacture of paper. In five groups the visiting delegates were taken to plants of the American Writing Paper Company at Holyoke to the Crocker-McElwain and Chemical Manufacturing Plant at Holyoke, the North Wilbraham plants of the Collins Manufacturing Company, the Hampshire Paper Mills at South Hadley Falls and the Strathmore Paper Company's plant at Woronoco. Besides furnishing guides, most of the big paper mills visited also furnished lecturers who described the various processes by which the raw materials are converted into high grade writing and printing paper. The history of the industry in this part of the country was also explained as well as the history of the mills themselves.

The Nashua River Paper Company at East Pepperell, Mass., together with the Berlin Mills (Brown & Co.), Berlin, N. H.,

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SOLE SELLING AGENTS
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Unbleached Sulphite 50 tons daily
Kraft Pulp 50 tons daily

Our pulp is made from Canadian Spruce
We ship in sheets, baled

BATHURST, NEW BRUNSWICK, CANADA

We specialize in raw materials for the manufacture of all grades of paper and offer from stock:

Casein
Casein Solvents
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We have for a long number of years furnished felts for some of the largest pulp, board, news and writing mills in the country.

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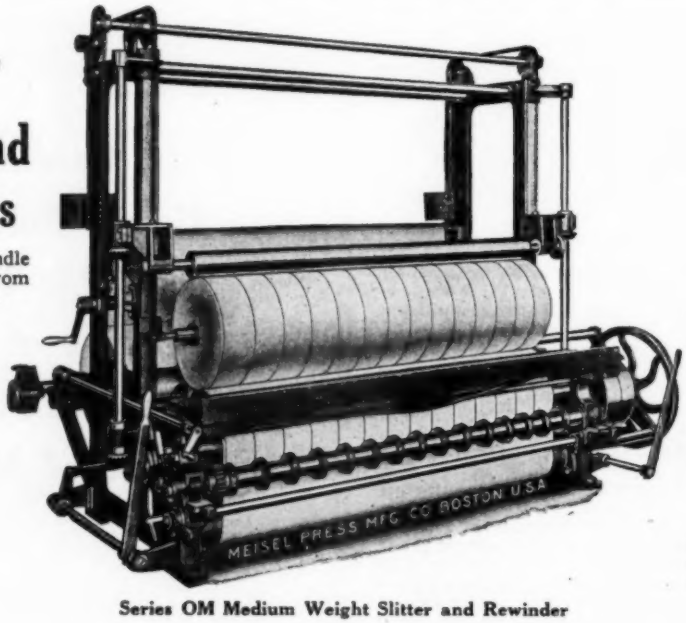
Any width, to handle any weight paper from tissue to cardboard.

Rolls up to 40 inches in diameter



Series OM Medium Weight Slitter and Rewinder

Manufacturers of

Adjustable Sheet Cutters

for tissue, waxed and other papers.

Rotary or Bed and Platen Presses

for printing all classes of paper, tissue to cardboard.

MEISEL PRESS MANUFACTURING CO.

948 Dorchester Ave., Boston 25, Mass.

started the ball rolling towards the new high level on kraft paper by advancing the prices from 6½c to 7c. The other big New England producers of kraft paper, the Claremont Paper Company, of Claremont, N. H., and Bellows Falls, Vt., state that they will take no more orders for kraft paper as they are entirely sold up for the month of December. This means of course that the entire field has established the higher level of 7c.

The Boston Chamber of Commerce through energetic action has secured modification of some of the difficulties in the way of port rulings and so has brought a large amount of wood pulp import business to the city of Boston. The Lagerloeff Trading Company of New York, one of the largest importers of wood pulp, has brought large cargoes of pulp recently to this city. It is stated in the trade that reports show that over a half a million tons of pulp wood are waiting in Sweden for export to the United States and that a very material proportion will come through Boston because of the excellent port facilities provided here and the elimination of lighterage which is a boon many importers are desiring who have used the port of New York extensively. There is no lighterage required in this port.

The fact that low water has influenced the paper production of New England was attested to when the writer was shown a letter a while ago addressed to the American Writing Paper Company's Boston distributors in which the company asked its customer indulgence for delays in deliveries inasmuch as low water in the Connecticut River was constantly hampering operations. Conditions are now improving and the situation at the time we write may be summed up in this way: The American Writing Paper Company is running nearer to full than any time this year, concentrating chiefly on low grades of paper for which demand is best. Taylor Logan is running full for the seventh week and has still orders ahead. The Hampshire Paper Company and the Carew Paper Company are running five days per week. The other paper mills in Holyoke, the Croker-McElwain Company, and the Chemical Manufacturing Company are running three days per week and the boxboard division of the Chemical is running full time.

The Government figures recently issued show that Massachusetts uses but little pulp wood and that little is of relatively high cost because of its being used in the sulphite process and is high grade Canadian spruce as a rule. The average cost of the wood used in Massachusetts pulp mills during 1920 was $22 per cord notwithstanding the great price reductions in pulpwood which occurred last year. The Government report brought out that Massachusetts is pre-eminently a fine paper producing state using large quantities of rags but comparatively little wood pulp.

The International Paper Company's offices in Boston have been removed to an upper floor from the quarters formerly occupied on the third floor of the International Trust Building. Here larger quarters are provided with private offices for John E. A. Hussey, New England manager, and the members of his selling staff. Stock rooms for the many specialty papers, m. f. book, wrappings, railroad writing envelopes, etc., are provided.

The Machias Lumber Company has installed its motors in the new grinding mill at Machias, Maine, and is now engaged in cutting up its large supplies of pulp wood which it has on hand in the river. The low water in the Machias River has been a source of difficulty in floating out logs.

Miami Valley

Dayton, Nov. 1, 1921.

There is no question but that the business of manufacturing paper, at least in the Miami Valley, has taken a decided turn for the better. The board and waxed paper and parchment mills all report more orders than they can handle. They are from three to six weeks behind orders now, and the average output seems to be about seventy per cent of the orders coming in. Several of the paper manufacturers decline to be too optimistic about the present condition, due to the nearness of the Christmas season, but the plants which manufacture board for food containers and waxed and parchment paper for the packing of food say that they feel sure there will be no great let up of orders.

The threatened railroad strike seemed to make no difference in the amount of orders received. There is a change, however,

Rubber Covered Felt Rolls

DO YOU KNOW

That we cover felt rolls with rubber that give better service than brass, wood or iron?

Our rolls wear perfectly smooth; do not burr, pit or roughen.

Preserves the felt by saving the nap.

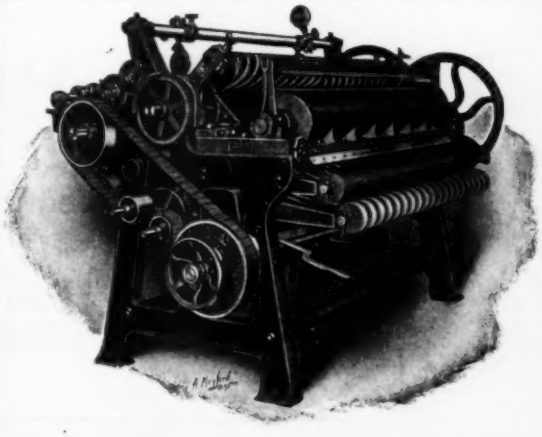
Holds felt in line better.

Write for names of satisfied customers using our rolls.

We Are Rubber Roll Specialists
Our Press Roll Stocks Are
the BEST on the Market.

The American Wringer Co.

Dept. R WOONSOCKET, R. I.



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Shafting, pulleys, hangers, couplings, collars, pillow blocks, worm-wheels, fly-wheels, and rope sheaves.

Makers of grey iron, and semisteel castings by analysis.

Special machinery built to order on modern tools at usual shop rates.

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Engineers, Founders, and Machinists

Established 1859—Incorporated 1877

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Guaranteed to Give Satisfaction

A free cutting Pulpstone that will produce more Pulp and withstand speed and pressure.

Magazine Grinder Stones in All Sizes
Samples and Quotations on request

The Smallwood-Low Stone Co.

World's Largest Producers of Pulpstone

LISBON, OHIO, U. S. A

in the date of delivery. As long as jobbers could give their orders subject to immediate delivery, they did so in small amounts, but now that the delivery date is some three to six weeks ahead, manufacturers say that the orders are coming in for larger amounts, which makes for cheerfulness in the offices of the paper mills.

On the first of October, newsprint price in Dayton dropped from 4¾c to 4c; a parchment company dropped the price of their product one cent a pound, leaving the base price seventeen cents per pound; but a board mill announced a raise in their price from $5.00 to $7.50 a ton, due to the rising cost of paper stock. When this raise was made, the board company was prepared to close down their machine, if orders could not be secured at the new price, but they reported about the middle of October that there was a sudden spurt in their business after the price was raised, and that they have not had as much business on hand for a year as they have today.

At Middletown, Ohio, the home of seven paper mills, all of the mills are running one hundred per cent full. The box manufacturers and the bag factories report the same thing. They all report that business began to pick up about the middle of September, and that they have been running full ever since.

At Franklin, Ohio, where six paper mills are located, all but one writing mill were operating to capacity the first of October, but now report a falling off of about one-fourth, that is with the exception of a board mill and a rag pulp mill.

The Champion Coated Paper Company, at Hamilton, Ohio, has the best record of all, for they have been operating to capacity since July first.

At West Carrollton, the paper men are very cheerful. The envelope factory is getting behind its orders, although they are working at top speed, the book mill is running two of its four machines, and the parchment company has all it can do.

At Dayton, the mill which makes paper for government envelopes is down completely, due to the pending postage bill, and until it is decided whether or not we are going to have a raise in the postage rates, no change will be made here, for Washington has ordered that all the two-cent envelopes on hand be used up, pending the decision. Dayton's other mill reports operating 85%, and they hope to better that very soon.

Altogether the Miami Valley situation is cheerful, much more cheerful than it has been for months.

Champion Mill Erects New Laboratory Building

Work has been started on a new reinforced concrete building of four floors at Hamilton, Ohio, which the Champion Coated Paper Company will use as a chemical laboratory. Mr. G. S. Martindale, chief engineer for this company, said that they had taken advantage of the dull period in the paper industry prior to July 1st to overhaul their paper machines and building equipment, and that this is the first time in years they have had an opportunity to make changes that were long ago recognized as really necessary. The work has gone ahead to completion even after the plant began to operate to capacity on July first.

In this chemical laboratory, they will control all the chemicals used throughout the paper mills and the coating mills. They expect to make up the finished compounds, and feed them from the reserve tanks in the laboratory building through pipes to all beaters, agitators and mixers, as needed.

In their boiler room, four new Sterling boilers with a rated capacity of 825 boiler horse power each have replaced a number of smaller boilers of 325 h. p. each. The new boilers are equipped with Foster superheaters and Green economizers, equipped with Vulcan soot blowers, which supersedes the old scraping mechanism, mechanically propelled. In the new boiler equipment, The Champion Coated Paper Company sees a saving of thirty per cent in the number of men necessary to be employed and the amount of coal consumed, which, based on an average of 9,000 boiler horse power per hour, is a very substantial saving indeed.

In their generator room, a new 4,000 kilowatt generator complete with condenser has been installed which gives 75 per cent greater capacity for generating electric current.

This is a huge plant, one of the largest, if not indeed the largest in the Miami Valley. Its equipment is being continually added to and improved upon. Experiments are continually in progress, and nothing is overlooked that will contribute to the betterment of its employees and its product.

John F. Rhoades, one of the engineers who has been associated with the Management Engineering & Development Company, of Dayton, Ohio, has been appointed to a similar position with the Mead Pulp & Paper Company, of Chillicothe, Ohio, his new duties beginning October 18th. Mr. Rhoades has been with the Management Engineering & Development Company for the last two years. Previous to that he spent seven years in the employ of the Great Northern Paper Company, at Millinocket, Maine.

J. E. Pooler, who left the Harding Division of the American Writing Paper Company, of Franklin, Ohio, several months ago, to accept a position as the head of the cost work for the Peerless Paper Company, of Dayton, Ohio, has resigned his new position, and left on October 20th for Seattle, Wash., where he expects to engage in business with his brother. The nature of the new venture was not made public.

"NORTHERN" Cranes and Hoists

Northern Engineering Works Detroit, Michigan

The "Hamilton" Felt

Our Cylinder Wet Felts for 9 points straw and for roofing are *open* in texture, *do not* stretch and *are durable.* A trial is invited.

SHULER & BENNINGHOFEN

HAMILTON, OHIO

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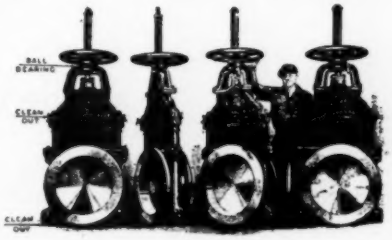
QUICK OPENING GATE VALVES

Lever, Screw or Rack Operated



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SOLVAY ALKALI

SODA ASH 58%
Contains 99+%
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TRADE MARK
REG. U. S. PATENT OFFICE

CAUSTIC SODA 76%
Contains 97+%
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Crown Filler for Paper Manufacture

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MANUFACTURERS OF

Soda Ash 58%

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Special Alkalies

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Address inquiries and communications to our general offices at

PITTSBURGH PENNSYLVANIA

New York, Nov. 1, 1921

STEADY improvement during the past few weeks has brought the paper industry up to a point where normalcy almost prevails. Mills are gradually increasing their production to take care of the expanding demand for paper and paper board of practically all kinds, jobbers are busy and are becoming increasingly so, while consumers the country over are once more absorbing supplies in something approaching usual volume, with the obvious result the industry as a whole is in a distinctly stronger and healthier position than in a lengthy interval. This situation, coming after such a long drawn out period of dullness and uncertainty, is naturally causing both producers and users of paper to proceed cautiously, but with the consumption of paper on the rise owing to broader requirements, trade activity is expanding in a most satisfactory manner while manufacturing operations are being increased to supply the heavier demand for paper.

Ample proof of the marked improvement can be had from the statistics included in the last Federal Trade Commission's monthly review of the paper industry, which show that production of paper and paper board in September exceeded that of all previous months so far this year by a wide margin. A total of 477,926 net tons of paper and paper board of all kinds was manufactured by United States mills in September, which is some 35,000 tons over the production in August, which in turn was the best month of the year for the paper industry. The next best month of 1921 so far was March, when 440,777 tons of paper were produced, and when it is considered that from this time on through the summer manufacturing operations almost steadily declined until the monthly output went down to 370,424 net tons in July, the full force of the very substantial increase in paper output during the last several months can be readily appreciated.

A most pleasing feature of the Commission's report for September is that in spite of the big jump in production during that month, mill stocks of paper decreased materially, being some 12,000 tons less at the end of September than at the outset of that month. This means, of course, that paper manufacturers not only are shipping out all their current production but that they are succeeding in reducing surplus holdings of their product, thus making for a much stronger technical market condition.

Paper manufacturers, mill agents and jobbers in general report a consistent broadening of demand for nearly all kinds of paper and board. With business in various lines on the mend, with advertising increasing, with newspapers, magazines and periodicals gaining circulation after prolonged period of backward sliding, with print shops busier and with other consumers of paper enlarging their operations, the need for paper is causing buyers to come into view in greater number and for appreciably larger amounts of paper. Leading economists, bankers and business men of the country assert that the period of readjustment and rehabilitation in the United States is over; that from now on we shall witness normal commercial and economic conditions and that business in general will thereby profit. It certainly seems safe to assume therefore that the pronounced improvement in the paper industry is of healthy and lasting character, and that the next few months at least will see paper production and consumption steadily on the climb.

As would be expected under the circumstances, prices on many kinds of paper and paper board are on the uptrend. The downward movement of values has been definitely checked in practically every quarter and certain grades of paper have advanced in price to some extent. The news print market is picking up at a favorable rate, which is a customary condition at this time of the year when merchants are advertising extensively to sell holiday goods and when, because of elections and other events, newspaper circulation increases. An interesting fact in this connection is that, according to a statement made by Stanley Claque, managing director of the Audit Bureau of Circulation, at the annual convention of that organization in Chicago recently, American newspapers have gained 100 per cent in circulation and the volume of advertising has increased proportionately within the last seven years. This is something for manufacturers of news print to dwell upon, as it means that three times the amount of print paper is required by the newspaper publishers of the country today than seven years ago because if publishers are carrying double the volume of advertising they must use twice as much paper, and three times as much to take care of the 100 per cent increase in circulation.

News print is selling in the spot market at around 4.25 cents per pound f. o. b. mills, and publishers in frequent instances are finding it necessary to enter the spot trade to purchase lots with which to augment their contract supplies. Book papers are moving in larger tonnage than in many months, and prices are firm. Machine finished book is selling at an average of 6.50 cents per pound f. o. b. delivery points, super at 6.75 cents and coated and enameled book at from 9 cents upward. Tissues are in steady demand and quotably firm at around 90 cents a ream for No. 1 white tissue, and wrappings are moving in regular fashion at a price basis of about 6.25 cents on No. 1 domestic kraft wrapping. Fine paper mills are operating at largely increased capacity and are finding an outlet for not only their present production but also a part of stored stocks, and quotations are being repeatedly advanced. Boards of all kinds are moving well. Paper box manufacturers are absorbing plain chip and news board in a consistent way at higher prices, while corrugated and folding box boards are in brisk demand with quotations moving upward sharply.

Few New Paper Machines Ordered for Next Year

Significant figures as to the future growth of the paper industry are made public by the American Paper and Pulp Association, which finds that only four new machines are scheduled for installation in the entire industry for 1922, as compared with the 53 machines being installed in 1921.

The record year of 1920, when such mills as the newsprint mills were producing at more than their registered capacity to meet the demands of publishers, was accompanied by the placing of contracts for much additional machinery. The year of 1921, however, with an influx of cheap foreign paper, in the absence of tariff legislation to protect manufacture in the United States, has seen contracts for little new capacity.

Figures just compiled show a total of 53 machines scheduled for this year and only four for 1922. Of the new machines scheduled this year, eight are for newsprint, ten each for book and board, five for wrapping, six for writing, seven for tissue, two each for roofing felt, glassine and specialties and one for blotting. The 1922 installation are one for book and three for board. The increase for the two years over 1920 is largest in felts and building with 12.5 per cent, board being next with 12.4 per cent and book third with 11 per cent. Newsprint shows an increased schedule of 9.2 per cent, tissue of 9, fine papers of 6.2 per cent and wrapping of 4.7 per cent.

New Members of T. A. P. P. I.

New members of the Technical Association of the Pulp and Paper Industry include the following, whose applications have been approved by the executive committee since the last meeting:

James G. Bullard, chemist, Crocker-McElwain Company, Holyoke, Mass.

C. E. Curran, chemist, Forest Products Laboratory, Madison, Wis.

Costa P. Genberg, chemist, Nekoosa-Edwards Paper Company, Port Edwards, Wis.

Chester L. Higgins, engineer, Finch, Pruyn & Co., Glens Falls, N. Y.

John Kepke, Jr., sales engineer, S. K. F. Industries, New York, N. Y.

Alfred F. McCoy, chemist, Tidewater Paper Mills, Brooklyn, N. Y.

The Hauser-Stander Tank Company, Cincinnati, has just sent out a very interesting booklet entitled "Wooden Tanks for Every Purpose," which is very instructive to anyone that uses wooden tanks. A report on "A study of the action of various chemicals upon different woods used for chemical tanks" would no doubt be helpful in this industry to those who use wood tanks to store or hold chemicals of any kind.

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ANIMAL SIZING GLUE STOCK

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21 East 40th Street, New York City

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BLEACHED AND UNBLEACHED

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ESTABLISHED 1895

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INCORPORATED

FOREIGN and DOMESTIC
Rags, Bagging, Rope and Waste Paper

Pulps, Wires, Chemicals, Etc.

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Now Is the Time to Buy Our Raw Materials

Out of the forty different kinds of paper stock graded in our many large warehouses, you are assured a steady, reliable source for procuring raw materials in practically every branch of paper making.

Having specialized for 35 years in this one field you can depend upon a clean, well-packed, uniform product throughout; fulfillment of delivery promises; and because of our output of 300 tons daily, big tonnage at all times.

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Papermaking Rags

Papermaking rags are in a much stronger market position than in a long period, probably than at any time thus far this year. Prices have steadily climbed in recent weeks and in most instances are now on higher levels than since values began tumbling downward in 1920 following the after-the-war boom in papermaking raw material. Moreover, the present situation has all the earmarks of being healthy. In certain cases, speculative operations have carried prices up a little beyond the points prevailing circumstances seem to warrant, but, in a general sense, the rise of the market during the past month or so has been occasioned by increased demand from consuming quarters, coupled with an acknowledged shortage of some grades of rags.

Dealers contend, and they seem logical in their contentions, that fewer rags have been collected through the country this year than in quite a space of years. Unfavorable business conditions and resultant "hard times" are blamed for this. It is readily admitted that when industrial conditions are bad rag collections drop—for two major reasons, one of which is that the public discards less clothing and therefore fewer rags are available, and the second that so little remuneration is afforded collections that fewer men resort to gathing rags for a livelihood.

It appears reasonable to believe, therefore, that at least some of the complaints registered by dealers over the shortage of rags are based on fact. On the other hand, it is hardly true that rags are as scarce as some are prone to make them out to be, but the difference in present supplies from those of more normal times is probably just sufficient to be creative of considerable well-founded bullishness in the rag trade.

Possibly the strongest item recently has been roofing rags. Felt paper mills have been actively in the market as buyers and values have advanced at a fairly rapid rate, and present indications are that they will likely go still higher. Sales of No. 1 roofing stock have been made in the Middle West at as much as 1.50 cents a pound f. o. b. shipping points, while in the East up to 1.25 cents has been paid for the same rags. Roofing rags, of course, constitute the bulk of papermaking rags, and there are no visible signs of any shortage of such material, though there is no question that buying by consumers of late has removed some large lots of stock in dealers' hands. Besides, comparatively large quantities of roofing rags from foreign sources have been absorbed.

New cuttings have risen sharply in price. This apparently has been caused to no small extent by trading among dealers, the larger concerns in the trade taking rags off the hands of small or weak holders and thus creating a stronger technical market situation. Nevertheless demand from paper mills has appreciably broadened, and the movement of cuttings into consuming channels is steadily increasing. No. 1 white shirt cuttings have advanced to within 10 and 11 cents per pound, with dealers especially confident about these rags and holding stocks with probably more firmness than any other grade. Washables are higher at from 4 cents per pound upward, and white lawns, unbleached muslins and blue overall cuttings also have scored advances.

Old white rags are quoted at around 6 cents a pound at dealers' points for No. 1 repacked and are meeting with a good deal more demand from mills.

Average quotations f. o. b. shipping points follow:

New Stock—	New York and Chicago
White shirt cuttings, No. 1	10.00-11.00
White shirt cuttings, No. 2	7.00- 7.50
Fancy shirt cuttings	6.25- 6.75
Washables, No. 1	4.00- 4.25
Unbleached muslins	9.00- 9.50
White lawns	8.75- 9.25
Overall cuttings, blue	6.25- 6.75
Black silesias	3.25- 3.50
Old Stock—	
Whites, No. 1 repacked	5.75- 6.25
Whites, No. 2 repacked	3.50- 4.00
Whites, house soiled	1.75- 2.00
Whites, street soiled	1.60- 1.75
Thirds and blues, repacked	2.00- 2.25
Thirds and blues, rough	1.40- 1.60
Black stockings	2.25- 2.50
Lace curtains	4.50- 4.75
Cotton canvas, No. 1	3.75- 4.00
White cotton batting	1.75- 2.00
Roofing, No. 1	1.25- 1.50
Roofing, No. 2	1.15- 1.40

Rope and Bagging

Old rope and bagging have shared in the increased activity in papermaking material and higher prices prevail on both these descriptions of goods. Old rope is particularly firm, with dealers as a general thing refusing to accept orders involving large lots of old manila rope at less than 4.75 cents per pound at shipping points. A comparatively large volume of business has been done at this price basis, and probably some consumers have paid slightly in excess of this figure. From all accounts, sufficient old rope is coming forward from producing quarters and from foreign sources to satisfy the wants of paper mills, yet dealers claim to have light stocks and say they are shipping out supplies as fast as received. Should demand continue to expand, therefore, the probabilities are in favor of further advancement in prices.

Old bagging is moving better and at higher quotations. Dealers argue that there is little inducement for them to grade out bagging at present, and most of them are endeavoring to sell mills mixed bagging instead of No. 1 scrap bagging, though, of course, some of the latter is being sorted. Between 90 cents and $1 per hundred pounds at shipping points represents the current market value of No. 1 scrap bagging, with No. 1 gunny bagging quoted at around 1.15 cents and roofing bagging at about 75 cents a hundred pounds.

Quotations f. o. b. shipping points are:

	New York and Chicago
Gunny, No. 1 domestic	1.10-1.25
Gunny, No. 1 foreign	1.00-1.15
Scrap bagging, No. 1	.90-1.00
Roofing bagging	.70- .80
Wool tares, heavy	1.50-1.75
Wool tares, light	1.25-1.50
Manila rope, No. 1 foreign	4.50-4.75
Manila rope, No. 1 domestic	4.60-4.80
Sisal strings	1.50-1.75
Mixed strings	.75- .85

Old Papers

Further sharp advances in the market value of waste paper have carried prices to higher levels than have prevailed at any time this year, and directly reflect improvement in the box board trade and many branches of the finished paper industry. A ready outlet among consuming mills has been provided for practically all grades and dealers have taken advantage of the situation and repeatedly marked up quotations, and have been occasioned no great difficulty in obtaining the prices asked, for the reason that mills have been in need of supplies and have willingly met the figures named to fill their requirements. As in rags, there is much talk about a scarcity of waste paper. This is probably so in a measure as concerns such grades as white shavings, and possibly ledger stock and old magazines, but there seems no logical reason why other grades should be in light supply. Printing shops the country over have for some months been working on curtailed schedules, which means fewer shavings have been cut than ordinarily, and it is quite likely that magazine circulation has fallen off and that less paper waste is secured from office buildings than normally, but certainly it would appear that old newspapers, mixed papers and similar descriptions should be in plentiful supply. However, as is invariably the cause when waste paper is in demand, prices have shot up with marked rapidity, and it is stated that packers are now asking prices on certain grades which are prompting consumers to turn to wood pulp rather than use the substitute material, owing to the relative higher cost of the latter.

Hard white shavings of No. 1 quality are quoted at 3.75 to 4 cents a pound at shipping points, and No. 1 soft white shavings at 3.40 to 3.60 cents, with some dealers asking above these prices. Old heavy No. 1 book stock is selling at 1.60 cents and higher, ledger stock at 1.75 cents, old No. 1 kraft paper

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Dealers in Domestic Chemical and Mechanical Pulps and Paper
AGENTS FOR
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STANDARD BLEACHING POWDER

Manufactured by
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High Grade Printing Paper
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BOOK AND COATED PAPER
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CASEIN
Standard Quality
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The Casein Manufacturing Company
15 Park Row New York

Bleached and Unbleached
WOOD PULP
of Every Description
M. GOTTESMAN & COMPANY
INCORPORATED
18 East 41st Street NEW YORK, N. Y.
Established 1888

at 2.25 cents, and white blank news cuttings at 2 cents. Folded newspapers are readily bringing 70 cents per hundred pounds at dealers' points, overissue newspapers 90 cents, and No. 1 mixed paper 55 to 60 cents. Quotations prevailing in the East show little difference from those named in the West, this being due in part to western buyers operating in New York and other eastern centers and sending prices there up to a parity with western values.

Quotations f. o. b. shipping points follow:

	New York and Chicago
Hard white shavings, No. 1	3.75-4.00
Hard white shavings, Nos. 2-3	2.50-3.00
Soft white shavings	3.40-3.60
Colored shavings	1.75-2.00
Heavy book, No. 1	1.60-1.70
Crumpled, No. 1	1.30-1.40
Ledger stock	1.75-1.90
Kraft, No. 1	2.20-2.30
Manilas, No. 1	1.00-1.15
White blank news	2.00-2.15
Overissue news, No. 1	.85- .95
Folded news	.65- .75
Mill wrappers	.70- .80
Box board cuttings	.65- .75
Mixed paper, No. 1	.55- .60
Common paper	.35- .40

Chemical Pulp

Reports generally aver that there is a fairly good movement of wood pulp toward consuming establishments. Dealers and mill agents invariably state that paper manufacturers are buying only to cover direct requirements, few being willing to anticipate their needs to the extent of placing orders covering future shipments a good ways ahead, but with board and paper mills in common running at greater capacity, more pulp is being consumed and buyers are brought into the market more often and for increased tonnage of pulp. Just by way of illustrating the fairly healthy market position of pulp, it is stated authoritatively that one of the foremost domestic producers of bleached sulphite is at present operating at something like 90 per cent of capacity and that the mill in question is shipping out sulphite at a rate of 130 per cent of its productive capacity, which means that considerable stored pulp is being removed.

Bleached sulphite of strictly No. 1 grade is selling freely at 4.25 cents per pound at pulp mills, with secondary grades ranging in price down to 4 cents. Easy bleaching sulphite is bringing 3 to 3.25 cents a pound at producing plants, No. 1 unbleached sulphite around 2.85 cents and news grade sulphite from 2.50 cents upward. Soda pulp is steady at 4 to 4.25 cents per pound at shipping points, with the association quotation at the higher figure. Domestic kraft pulp is selling at 3 cents for the best grades and down to 2.75 cents.

F. o. b. pulp mill quotations are:

Bleached sulphite	4.00-4.25
Easy bleaching sulphite	3.00-3.25
Unbleached sulphite, No. 1	2.75-3.00
News grade sulphite	2.50-2.75
Soda pulp, bleached	4.00-4.25
Mitscherlich, unbleached	3.50-3.75
Kraft, No. 1	2.75-3.00
Screenings, refined	.85-1.00

Mechanical Pulp

The possibility of a shortage developing later in the season, and a steady demand of fairly broad dimensions from consuming sources make for a firm demand for mechanical wood pulp. Reports from grinding districts tell of very unfavorable water conditions, it being said that in numerous cases mill streams are lower than at any time during the past summer, and those on the selling end of the trade naturally are emphasizing this phase of the situation. At the moment, supplies seem ample to cover the wants of consumers, but statistics show that present consumption of ground wood is exceeding the production, and should this condition continue for any appreciable time, it stands to reason that available stocks would run low and that prices would advance.

The current market basis on prime spruce ground wood of domestic or Canadian origin is around $30 per ton at grinding mills. Sales at higher than this level have been recorded, but chiefly only in cases where the consuming plant has been situated near the producing mills, whereupon a low freight rate is involved. Most grinders are quoting at a basis of between $38 and $40 a ton delivered, their f. o. b. shipping

Bardeen Paper Co.

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Printing Papers of Merit

For LETTERPRESS, OFFSET *and* LITHOGRAPHIC PRINTING

Offset Blanks Offset Bristols

Porcelain, Peninsular and Purity Enamel Book

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EASTERN MANUFACTURING COMPANY

BLEACHED SULPHITE

Made from spruce grown in the forests of Northern Maine.

Send for Samples.

EASTERN MANUFACTURING CO.

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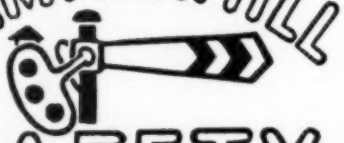

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The Standard Utility Business Papers and the Most Widely Used Papers in the World

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HAMMERMILL PAPER CO., Erie, Pa.
NEW YORK OFFICE: 261 BROADWAY

Lincoln Paper Mills
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Manufacturers of

Machine Finish Writings

Machine Finish and Super Calender White and Colored Book

Extra Machine Finish and Super Calender Litho

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The
Hinde & Dauch Paper Co.

Corrugated Fibre Shipping Boxes and Packing Materials of Acknowledged Superiority

Sales offices in principal cities

MAIN OFFICE
SANDUSKY, OHIO

WOLVERINE Paper Company

"Wolverine" Waxed Papers for Every Requirement

Best Quality

Waxed Tissue a Specialty

OTSEGO, MICHIGAN

point prices depending on the distance the pulp has to be hauled and the resultant freight charges.

Chemicals

Paper and pulpmaking chemicals are moving in a moderately regular manner and in comparatively good amounts. A majority of consuming mills are managing to make contract supplies suffice under present conditions, and yet transient buyers are in considerable evidence and are helping to enliven the market. Soda ash is in steady demand, and the domestic product is quoted in bags for spot delivery at around 2.15 cents per pound ex warehouse or producing plant, while some imported soda ash is offered at between 1.75 and 1.85 cents c. i. f. New York. Standard brands of caustic soda for prompt shipment are quoted at about 4 cents, with outside brands available down to 3.50 cents f. o. b. works. Casein is in moderate demand at a quotable range of 6.50 to 8.50 cents per pound, depending on quality and amount wanted, while brimstone is selling at $15 to $16 a ton at the mines. Bleaching powder holds steady at around 2.50 cents per pound for the domestic product, with foreign bleach offered down to 2 cents. Quotations follow:

Alum, lump ammonia	3.50- 3.75
Alum, lump starch	4.00- 4.25
Blanc fixe, powdered	3.50- 3.75
Bleaching powder (domestic drums)	2.00- 2.50
Brimstone (ton)	15.00-16.00
Casein	6.50- 8.50
Caustic soda, spot delivery	3.50- 4.00
China clay, domestic washed	9.00-10.00
China clay, foreign	15.00-20.00
Rosin, grade E	5.85-
Satin white	2.00- 2.25
Soda ash, 58 per cent light (bags)	1.75- 2.25
Sulphite of alumina, commercial grade	1.60- 2.00
Starch, papermakers', in bags	2.20- 2.40
Talc (ton)	15.00-18.00

Canada's Pulpwood Resources

A study of the pulpwood situation in eastern Canada by the Dominion Commission of Conservation gives a total estimate of actually available spruce and balsam in Quebec, Ontario, New Brunswick and Nova Scotia as, roughly speaking, 306,000,000 cords, with a possible addition of 38,000,000 cords in Ontario with the extension of the Temiskaming & Northern Ontario Railway. Accessible and inaccessible, the commission places the supply of spruce and balsam in the eastern provinces at 501,000,000 cords.

The commission's estimate includes 100,000,000 cords in Ontario, 18 per cent of which is privately held; 155,000,000 cords in Quebec, 14 per cent private; 26,000,000 cords in New Brunswick, 46 per cent private. and 25,000,000 cords in Nova Scotia, practically all privately held. The annual consumption and pulpwood exports of spruce and balsam from these four provinces is between 5,000,000 and 6,000,000 cords.

British Columbia is estimated to contain 92,000,000 acres of absolute forest land, of which 33,000,000 acres contain merchantable timber, about half of which has been damaged by fire. There are estimated to be 225,000,000 cords of pulpwood in the Pacific Coast province. Exploitation in this province has only begun, but already British Columbia ranks third as producer in the nation's pulp anl paper industry and very extensive developments in the near future are assured.

The totally unexploited pulpwood resources of the prairie provinces are estimated to account for 85,000,000 cords. Great areas of young forest growth exist on lands previously burned and these should in time appreciably supplement the present pulpwood supply.

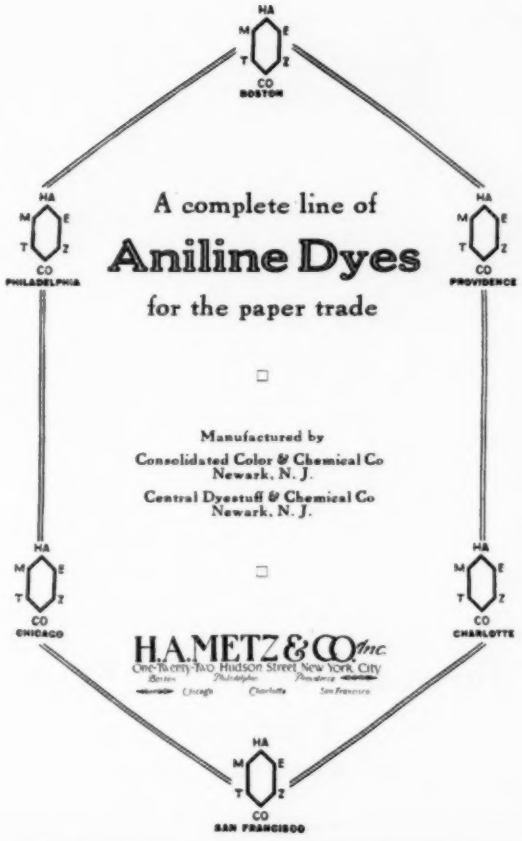
Pulp Mill Company Gets Permit to Use Idaho Rivers

Attorney General Black has issued a permit for the use of the Snake river and other navigable streams in Idaho for the use of floating logs. The permit was issued to the Howard Pulp & Paper Mill Company, which plans the building of a paper mill at Idaho Falls.

This paper mill was planned several years ago, but war and financial conditions prevented its being capitalized.

Paul H. Kollinz, of Denver, who organized the company, has interested London and New York capital in the enterprise.

The source of supply is the timber at the head of the south fork in Idaho and Wyoming. The government report showed timber suitable for pulp and paper making in quantities sufficient to last fifty years. The plan is to float the logs down the river to Idaho Falls, where the mill is to be located.



Sulphate Alumina

All Grades for Paper Mills

Detroit Chemical Works

DETROIT MICHIGAN

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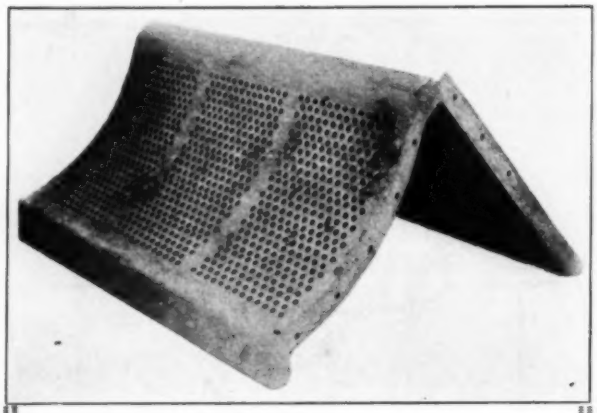
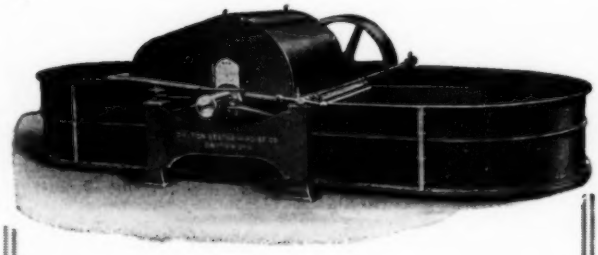
A PERFECT SUBSTITUTE FOR IRON FREE



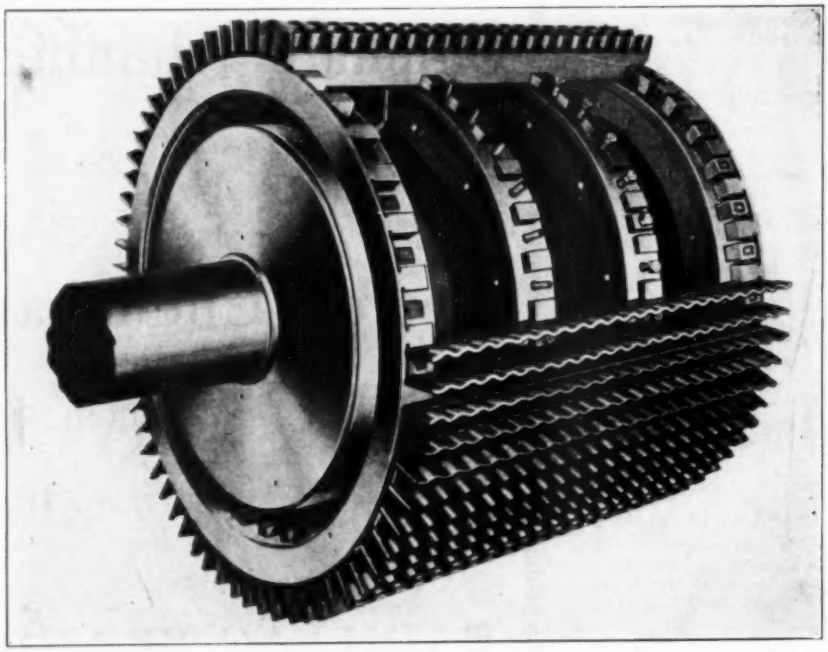
Because there are no moving parts this is a very simple but very efficient device. Patent No. 1,271,426 issued to Mr. Brownell Buehler, July 2nd, 1918.

The Shartle Continuous Beater Company
MIDDLETOWN, OHIO



"Dayton" Beating Engines are Built for Heavy Duty

Dayton Beater and Hoist Co.
DAYTON, OHIO



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1. Slotless bars which means no broken ears.
2. A bar designed for maximum strength.
3. Lugs on heads machine finished insuring a perfect fit.
4. Bars require no shimming.
5. Wedges self centering.
6. Wedges drawn down by heavy wrought iron bolts with brass nuts.
7. Nuts locked by ribs on cover plates.
8. Damaged bars can be replaced without disturbing the others.
9. It is unnecessary to raise roll from bearings when refilling.
10. Roll can be refilled in one-fourth the average time.

DAYTON GLOBE BAND LESS BEATER ROLL

WE SOLICIT YOUR INQUIRIES

DAYTON GLOBE IRON WORKS, **Dayton, Ohio**

New Papers

Writing—	
White rag	14-40
White sulphite, No. 1	9-20
Colored	12-40
Ledger—	
White rag	15-50
White sulphite	11-25
Colored sulphite	13-25
Colored rag	17-50
Bonds—	
White rag	12-40
White sulphite	8-20
Colored sulphite	10-22
Colored rag	14-40
Book	
No. 1 S. & S. C.	6.50- 7.00
Machine finished	6.00- 6.50
English finished	6.50- 7.25
Coated and enameled	9.00-10.00
Lithograph, M. F.	10.00-11.50
News Print—	
Rolls, contract	4.00-
Rolls, transient	4.00- 4.25
Sheets	4.50- 4.75
Side runs	3.50- 3.75
Cover Stock—	
Coated, both sides	9.25-
Coated, one side	9.20-
Tissue—	
No. 1 white, 20x30	.80- 1.00
No. 2 white, 24x36	.80- .90
No. 1 manilla, 24x36	.80- .90
Kraft	.90- 1.15
Wrappings—	
No. 1 kraft	6.00- 6.50
No. 2 kraft	5.50- 6.00

Boards—

	New York and Chicago
Solid news	45.00-50.00
Straw	45.00-50.00
Plain chip	40.00-45.00
White coated chip	60.00-70.00
Manila coated chip	55.00-60.00
Binders' board	70.00-80.00

Trade Association Vital to Business Progress

"The trust is imperialism. The trade association is democracy. Any organization which assumes the dominating, monopolistic, dictatorial attitude of imperialism, whether that organization is of business, labor or politics, will fall as surely as imperialistic houses of Europe have fallen before the onward sweep of political democracy," said O. B. Towne, secretary of the Waxed Paper Manufacturers' Association, in discussing the philosophy of the trade association before the national convention of the Association Trade Executives at its opening session today.

"Imperialism in business is economically unsound. It therefore cannot survive, for the principle of economics is eternally operative. It recognizes no time, no political boundaries, no nationality, no latitude or longitude, no race or creed. It is the same in substance as it has always been and will always be.

"In the earliest days men gathered together when faced by danger, for protection against disaster. But as soon as such groups of men became aggressive and compelled tribute they fell. That which is economically unsound undermines itself and falls.

"The American business man today is no longer a citizen of America, but his citizenship is of the world. His business is no longer confined within the nation's boundaries, but is world-wide. And to meet the competition of the world, the brightest minds of every industry must group to give to each the experience of all. That is the trade association.

"The trade association, like all other organizations, has three fields, one of which is fatal to itself. The trade association is a group of men in a similar business activity associated together for protection against common evils and for the development of processes and methods, improvement of manufacturing or distributing processes. The moment the trade association goes into the aggressive field to demand tribute, the economic law begins to work, and the association cannot survive. Today the American government has recognized this to the extent that law compels the trade association to remain within its two legitimate fields and to prevent its own suicide through improper activities. The trust is imperialistic when it disregards responsibility. The association is the democracy of industry because it has group purpose, group effort and group responsibility and the principle of the greatest good to the greatest number."

President of Trade Executives Scores Illegal Associations

"First among the standards of the trade executive should, I believe, be absolute open co-operation on the part of our respective associations with the United States Government and with the public at large, and personally I approve Mr. Hoover's suggestion of open information," said President Emmet Hay Naylor, of the American Trade Association Executives, in opening the annual convention at the Drake Hotel, Chicago, October 26. Mr. Naylor, who is secretary of the associations of fine paper manufacturers, and one of the best known secretaries whose organizations are federated in the American Paper and Pulp Association, continued:

"By reporting definite representative information to the Government, the association will be strengthened and benefit will come not only to the industry, but to our national industrial stability through a clear, frank understanding of facts. If the reports of an association are carefully and accurately compiled, they can only benefit the industry and the members of the association by being made public. If they misrepresent and hurt the industry, it is because the trade association has not accurately compiled and presented the facts. The elimination of mushroom, illegal trade associations is absolutely necessary not only for the good of the public but for the good of our profession as a trade association.

"I cannot resist very forcefully suggesting that if the general facts about business conditions in an industry are to be made public through a government agency, that the government agency use the trade association which represents that industry as the source of correct information. Otherwise, there would have to be a board of experts at Washington for practically every industry, to do the work in which the existing trade association is a specialist."

N. M. Brisbois, Pres. of Mich. Division, A. P. & P. M. S. A.

Nicholas N. Brisbois, general superintendent of the Sutherland Paper Company has been elected president of the Michigan division of the American Paper & Pulp Mill Superintendents Association, at their recent meeting held in Kalamazoo. Other officers elected are: First vice-president, E. H. Gilman, Bryant Paper Company; second vice-president, Michael Redmond, Kalamazoo Paper Company; third vice-president, G. W. Ulrich, Wolverine Paper Company; secretary-treasurer, Geo. H. Pountain.

This division meets once a month and expects to have some very important and helpful gatherings during the fall and winter season.

New Officers of the Northwestern Division A. P. & P. M. S. A. Elected

At the annual meeting of the Northwestern Division of the American Pulp and Paper Mill Superintendents Association, held at Wisconsin Rapids, Wis., on September 23 and 24, the following officers were elected: Chairman, John Hercher, of the John Strange Paper Company, of Menasha, Wis.; vice-chairman, Carl W. Sharplos, Menasha Printing and Carton Company; secretary-treasurer, F. A. Beisel, Menasha Printing and Carton Company.

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Books on Paper Manufacture

Subscriptions are being taken for the new Textbooks on the Manufacture of Pulp and Paper of the Joint Committee on Vocational Education of the Pulp and Paper Industry, a complete set of which should be owned by every firm or individual connected with the industry.

The set will be complete in five volumes. Volumes I and II deal with arithmetical operations, elementary mathematics, drawings, etc. Volumes III, IV and V, to be issued shortly, will deal with pulpwoods and their preparation; manufacture of pulp; analytical methods; and paper manufacture in all its aspects.

Volumes I and II are now on sale at $5.00 a volume. In the selection of classroom problems bearing on the principles and practice of pulp and paper manufacture they represent the highest standard in textbook publishing.

Orders, with remittances, will be filled by the Technical Association of the Pulp and Paper Industry, 18 East Forty-first Street, New York.

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Wood Pulp

Increased trade activity in imported wood pulp has kept pace with the improvement in the paper industry of the United States and the market is gradually getting into a stronger and healthier condition. Paper manufacturers are buying quite freely, and are placing orders not alone to cover prompt requirements but also against forward needs, and, on the whole, there is a larger volume to current business than probably in over a year. Indications are that spot stocks of foreign pulp in this country have been very nearly liquidated. Proof of this was had several weeks ago when a sudden run of demand from consumers for Scandinavian kraft pulp for immediate delivery caused prices on this kind of pulp to bound upward quickly, and when some considerable premiums were paid by papermakers for spot lots of kraft. Moreover, the anti-dumping agitation has prompted importers to be wary in their operations and has discouraged the bringing in of pulp from European sources excepting on actual orders from consumers.

The anti-dumping situation has as yet developed nothing new of a concrete nature. Trade representatives of the United States Government are understood to be still investigating the matter in primary markets in Europe, and pulp importers in this country are awaiting the promulgation of the official reports from these Government investigators before making any definite move to discredit the so-called anti-dumping agitation. Members of the Association of American Wood Pulp Importers, in New York, assert that they have positive documentary proof that European producers are not dumping pulp into the American market, and appear to be biding their time for the opportune moment to make public this proof. Members of the importers' association in New York have held a number of conferences, at which have been present several leading pulp trade authorities from Sweden and other pulp-producing countries in Europe, and at which the charges of dumping have been gone into thoroughly.

Reports from primary pulp sources abroad are generally of a bullish character. Sales by Scandinavian, German and other European manufacturers have increased largely during the past few weeks to American consumers and to papermakers in other countries, England included. Stocks of pulp at producing centers are said to have been greatly reduced, and in a good many cases it is stated that mills on the other side are now shipping out pulp as fast as it is made and that surplus holdings have been entirely removed. The fact should not be overlooked that pulp manufacturers in Europe are not operating on anything approaching a normal scale today, so that it does not require any exceptionally heavy demand to absorb the supply that is available.

As is usually the case at about this season of the year when United States consumers and others seek to place orders for pulp to be shipped prior to the closing of the Baltic for the winter, quotations evince a stiffening tendency. Scandinavian kraft pulp, which is favored with a steady demand of fairly broad dimensions, is selling at an average of 2.75 cents per pound ex the dock at New York or other Atlantic ports. Sales of the best grades have been recorded up to 3 cents, while secondary grades are bringing between 2.50 and 2.75 cents. Foreign unbleached sulphite of No. 1 quality is quoted at around 2.75 cents, with prices ranging down to 2.60 cents and as high as 2.85 cents. Bleached sulphite is selling freely at 3.85 to 4 cents a pound for No. 1 sulphite, and easy bleaching sulphite commands between 3 and 3.25 cents on the dock.

Importations increased largely during the past month. A single shipment comprising 75,000 bales recently arrived on a steamer from Sundsvall discharging at Baltimore.

Receipts at the port of New York in October, and current quotations follow:

Bleached sulphite	$ 3.85- 4.00
Unbleached sulphite, No. 1	2.60- 2.85
Easy bleaching	3.00- 3.25
Mitscherlich unbleached	2.75- 3.00
Kraft	2.50- 3.00
Ground wool, per ton	28.00-30.00

Lagerloef Trading Co., 4,774 bls. from Kotka, 3,500 bls. ground wood from Helsingfors and 6,000 bls. sulphite from Trangsund: A. J. Pagel & Co., 300 bls. sulphate from Gothenburg and 600 bls. from Sundsvall: Castle, Gottheil & Overton, 2,071 bls. from Rotterdam; American Woodpulp Corp., 15,650 bls. sulphite from Sundsvall and 919 bls. from Copenhagen; National City Bank, 3,500 bls. sulphite from Sundsvall; Nilsen Rantoul & Co., 1,000 bls. from Stenkjar and 950 bls. from Christiania; American Exchange National Bank, 125 bls. sulphite from Christiania; Tidewater Paper Mills, 15,375 bls. from Christiania; National Bank of Commerce, 2,500 bls. sulphite from Sundsvall; J. Anderson & Co., 1,050 bls. from Christiania; E. Butterworth & Co., 90 bls. from Christiania; Brown Bros. & Co., 671 bls. sulphite from Hamburg; Order, 9,192 bls. from Gothenburg, 800 bls. from Christiania, 4,830 bls. from Stugsund, 2,078 bls. from Hamburg; 10,160 bls. from Helsingfors (discharged at Newport News), 75,000 bls. from Sundsvall (discharged at Baltimore), 3,432 bls. from Helsingfors (discharged at Boston), and 12,544 bls. from Helsingfors and 19,465 bls. from Gothenburg (discharged at Philadelphia).

Paper Stock

Importations of papermaking material are beginning to increase, reflecting the growing consumption in this country and the resultant broader demand from paper manufacturers. Receipts during October were substantially larger than in the several preceding months, and importers are quickening their activities and are placing orders for additional supplies in England, France, Germany and other European countries. Old rope imports showed a considerable increase last month, and there were also more rags brought in from foreign sources than in some time. Low exchange on European countries is enabling importers to market goods in the United States at attractive prices, and paper manufacturers evidently are taking advantage of the situation and are increasing their buying of foreign stock, in many instances finding such material is to be had at relatively lower cost than domestic goods.

Arrivals at the port of New York in October follow:

Old Rope

Brown Bros. & Co., 143 coils from Bristol and 140 bls. from Hull; E. J. Keller Co., 85 bls. from Bristol, 88 coils from Leith and 191 bls. from Rotterdam; Ladenburg, Thalman & Co., 100 coils from Hamburg; Salomon Bros. & Co., 318 coils from Hull and 36 bls. from Rotterdam; W. Schall & Co., 99 coils from Hull and 73 bls. from Barcelona; First National Bank of Boston, 80 bls. from Antwerp; American Express Co., 110 coils from Antwerp; V. Galano, 57 bls. from Port Sudan; Daniel M. Hicks, Inc., 75 bls. from Glasgow; Irving National Bank, 124 coils from Antwerp, 50 coils from Glasgow and 162 bls. from Copenhagen; Atlantic National Bank, 57 bls. from Antwerp; Luckenbach Steamship Co., 60 coils from Rotterdam; W. H. Cummings & Sons, 12 bls. from Barcelona; Olympic Rubber & Metal Co., 33 bls. from San Juan; Order, 64 bls. from Marseilles.

Old Bagging

Equitable Trust Co., 130 bls. from Havre; E. Butterworth & Co., 61 bls. from Havre; E. J. Keller Co., 61 bls. from Antwerp and 687 bls. from Rotterdam; Castle, Gottheil & Overton, 108 bls. from Hull; Mechanics & Metals National Bank, 412 bls. from Antwerp; Luckenbach Steamship Co., 159 bls. from Rotterdam; Guaranty Trust Co., 104 bls. from Manchester.

Rags

Parsons & Whittemore, 648 bls. from Hamburg; American Woodpulp Corp., 163 bls. from Hamburg and 55 bls. from Bremen; Ladenburg, Thalman & Co., 27 bls. from Hamburg; P. Berlowitz, 121 bls. from Bremen; Mechanics & Metals National Bank, 47 bls. from Bremen; Brown Bros. & Co., 216 bls. from Antwerp; E. Butterworth & Co., 676 bls. from Rotterdam; E. J. Keller Co., 1,317 bls. from Brement, 152 bls. from Havre and 31 bls. from Rotterdam; Goldman, Sachs & Co., 140 bls. from Havre; Katzenstein & Keene, 159 bls. from Havre; R. F. Downing & Co., 146 bls. from Rotterdam, 306 bls. from London and 128 bls. from Manchester; Salomon Bros. & Co., 31 bls. from Rotterdam; W. Schall & Co., 139 bls. from Bremen; Atlantic National Bank, 320 bls. from Bremen; Luckenbach Steamship Co., 487 bls. from Rotterdam; Bank of Montreal, 40 bls. from Manchester; Irving National

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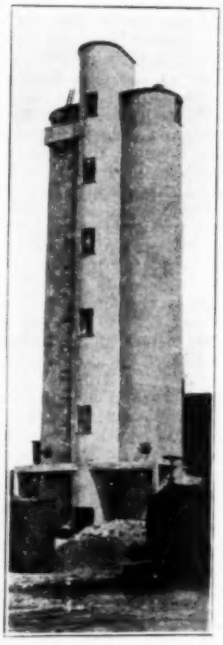

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Bank, 86 bls. from Manchester; State Bank, 56 bls. from Hamburg; Order, 40 bls. from Liverpool and 72 bls. from London.

Miscellaneous Paper Stock

Irving National Bank, 23 bls. from Antwerp; E. Butterworth & Co., 15 bls. from Havre and 696 bls. from Belfast; Baird-Daniels Co., 181 bls. from Rotterdam; Ladenburg, Thalman & Co., 71 bls. from Glasgow; Castle, Gottheil & Overton, 91 bls. from Antwerp; Order, 21 bls. from Dundee.

Paper

Imports of paper into the United States during October were minus feature. Usual amounts of cigarette, filter, hanging and writing papers were received, and there were several sizable shipments of wrapping paper from European sources. News print imports were below those of the several preceding months, though this is not believed to carry any special significance. Arrivals at the port of New York in October follow:

Cigarette

Rose & Frank Co., 72 cs. from Havre; American Tobacco Co., 264 cs. from Havre and 300 cs. from Bordeaux; B. E. Teale, 54 cs. from Marseilles; P. J. Schweitzer, 100 cs. from Marseilles; J. V. Lago, 2 cs. from Allicante; F. B. Vandegrift & Co., 9 cs. from Barcelona; Surbrug Co., 26 cs. from Havre; Southern Pacific Co., 2 cs. from Havre.

Printing

Chemical National Bank, 420 rolls from Hamburg; Atlantic Forwarding Co., 4 rolls from Hamburg; H. Reeve Angel & Co., 90 rolls from Kotka and 587 rolls from Helsingfors; Globe Shipping Co., 81 cs. from Hamburg; B. F. Drakenfeld & Co., 17 cs. from Liverpool; Sun-Herald Corp., 1,318 rolls from Helsingfors and 1,331 rolls from Gothenburg; Fred Enders & Co., 31 rolls from Hamburg; National City Bank, 594 rolls from Copenhagen, 834 rolls from Norrkoping and 2,088 rolls from Hallstavik; National Park Bank, 1,277 rolls from Sundavall; American Express Co., 387 rolls from Sundsvall; L. A. Consmiller, 305 cs. from Rotterdam; E. C. Melby, 25 rolls from Christiania; Bernard, Judae & Co., 9 cs. from Hamburg; Parsons & Whittemore, 74 rolls from Rotterdam; H. Lips, 105 cs. from Antwerp; C. L. Robinson, 44 rolls from Christiania; P. C. Tuhlke, 199 cs. from Antwerp; Agar Bernson Corp., 84 rolls from Hamburg; U. S. Forwarding Co., 19 rolls from Rotterdam; New York & Cuba Steamship Co., 187 rolls from Sundsvall; Neuschaefer Sherwin Bros., 11 rolls from Hamburg; Order 68 rolls from Kotka, 335 rolls from Sundsvall, 174 rolls from Christiana; 280 rolls from Hamburg and 494 rolls from Helsingfors.

Wrapping

Ladenburg, Thalman & Co., 1,798 rolls from Hamburg; Blauvelt-Wiley Paper Mfg. Co., 440 cs. from Glasgow; Coy-Hunt & Co., 999 rolls and 309 bls. from Gothenburg; Heule Waxed Paper Co., 10 cs. from Southampton; Republic Bag & Paper Co., 877 rolls from Hamburg; Order, 223 cs. from Marseilles.

Hanging

J. W. Hampton, Jr., & Co., 16 cs. from Havre; A. C. Dodman, Jr., & Co., 10 bls. from Marseilles and 11 cs. from Antwerp; R. F. Lang, 1,248 bls. from Hamburg; R. E. Thibout & Co., 2 bls. from London; W. H. S. Lloyd & Co., 8 cs. from London and 1 cs. from Antwerp; Prager Co., 832 rolls from Hamburg and 829 rolls from Antwerp.

Writing

Travis & Parks, 2 cs. from Havre; J. W. Hampton, Jr., & Co., 35 cs. from Hamburg; Tice & Lynch, 12 cs. from Havre; George Borgfeldt & Co., 2 cs. from Ponce: H. W. Robinson & Co., 4 cs. from Liverpool and 8 cs. from Hamburg; Whiting-Patterson Co., 2 cs. from Havre; E. Dietzgen & Co., 27 cs. from Marseilles; F. B. Vandergrift & Co., 4 cs. from Hamburg.

Drawing

Lunham & Moore, 12 cs. from Rotterdam; Keuffel & Esser Co., 2 cs. from Liverpool and 86 cs. from Hamburg; P. Puttmann, 5 cs. from Antwerp; E. Dietzgen & Co., 4 cs. from Hamburg.

Filter

Lunham & Moore, 20 cs. from Rotterdam; E. Fougera & Co., 47 cs. from Southampton and 40 cs. from Bordeaux; M. Weiss Co., 69 bls. from Bordeaux: C. G. Euler, 30 bls. from Bordeaux; Druggists Supply Co., 46 cs. from Bordeaux.

Tissue

Meadows, Wye & Co., 6 cs. from Liverpool; Wilkinson Bros. & Co., 2 cs. from Liverpool: Davies, Turner & Co., 5 cs. from Liverpool; G. W. Sheldon & Co., 2 cs. from Liverpool; Whiting-Patterson Co., 2 cs. from Havre.

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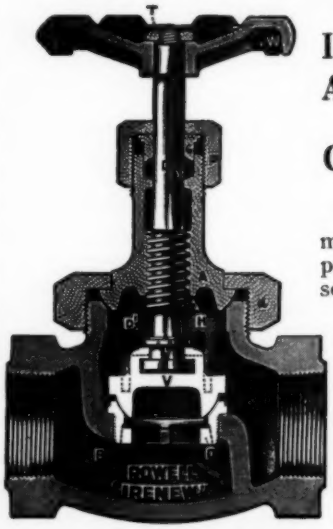

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Boards

C. B. Richard & Co., 8 cs. from Bremen; Wiebush Calendar Importing Co., 58 cs. from Hamburg; Eastern Calendar Co., 8 cs. from Hamburg; Lewin & Co., 7 cs. from Hamburg; Quality Art Novelty Co., 2 cs. from Hamburg; Lagerloef Trading Co., 262 rolls from Helsingfors and 112 bls. from Kotka; Kuhne, Nachod & Kuhne, 33 cs. from Hamburg; G. H. Goldenberg, 5 cs. from Hamburg; G. Roesche, 2 cs. from Hamburg; Bendix Paper Co., 159 cs. from Hamburg; Hensel, Bruckman & Lorbacher, 2 cs. from Bremen; Prager Co., 47 cs. from Hamburg; Metropolitan Import & Mfg. Co., 31 cs. from Hamburg; W. B. Wheeler Corp., 100 cs. from Bremen; H. Reeve Angel & Co., 34 bls. from Hamburg.

Miscellaneous

American Shipping Co., 7 cs. from Hamburg; Goodman & Levy, 29 cs. from Havre; Japan Paper Co., 49 cs. from Yokohama and 6 cs. from Havre; Foreign Paper Mills, Inc., 2 cs. from Gothenburg; Wilkinson Bros. & Co., 2 cs. from Gothenburg; Globe Shipping Co., 3 cs. from Copenhagen; Phoenix Shipping Co., 13 cs. from Hamburg; R. F. Downing & Co., 2 cs. from London; Eastman Kodak Co., 14 cs. from Melbourne; J. & J. Scott, 48 rolls from Antwerp; F. R. Arnold & Co., 6 cs. from Antwerp; A. Flinn & Co., 3 cs. from Havre; Coenca, Morrison & Co., 11 cs. from Havre; Irving National Bank, 30 bls. from Hamburg and 19 cs. from Antwerp; A. Frankan & Co., 2 cs. from Hamburg; Kaufman & Strauss Co., 4 cs. from Hamburg; F. L. Kraemer & Co., 15 cs. from Hamburg; Stern Shipping Corp., 28 cs. from Hamburg; Brooks Paper Co., 6 cs. from London; T. D. Downing & Co., 4 cs. from Havre; F. W. Devoe & Raynolds Co., 16 cs. from Havre; J. W. Lyon & Co., 32 cs. from Havre; W. A. Foster & Co., 47 cs. from Rotterdam; Happel & McAvoy, 4 cs. from Bremen and 6 cs. from Hamburg; G. W. Sheldon & Co., 8 cs. from Havre; H. Kayser & Fils, 6 cs. from Havre; H. D. Catty & Co., 33 cs. from Havre; Sinclair & Valentine, 4 cs. from Hamburg; P. Puttmann, 6 cs. from Antwerp; R. H. Macy & Co., 2 cs. from Hamburg; J. S. Plummer & Co., 6 cs. from Yokohama; L. Wolf & Co., 20 cs. from Hamburg; G. W. McIver & Co., 10 cs. from Bremen; United Print Co., 10 cs. from Havre; E. G. Uhlmann & Son, 8 cs. from Hamburg; Transatlantic Shipping Co., 2 bls. from Hamburg; U. S. Forwarding Co., 142 cs. from Hamburg; A. T. A. Merchandise Corp., 153 rolls from Hamburg; Order, 13 cs. from Hamburg, 5 cs. from Havre and 12 cs. from London.

Association Officer Pleads for Trade Journals

The relation of the trade association to the trade journal, as well as the possibility of close co-operation by the trade association with the house organs published by individual members of the particular industry involved formed the subject of extensive discussion at the monthly meeting of trade secretaries of New York on Tuesday, October 18.

The speaker of the day was Dr. Hugh P. Baker, executive secretary of the American Paper and Pulp Association, who struck what seemed to be the keynote of the day in his declaration that the trade association should endeavor to co-operate with the trade journals of his industry.

"The official publication of a trade association, its bulletin or magazine or whatever form its published material may take, should never be of a nature to place the association publication in competition with the trade journal," said Dr. Baker. "The trade journal has a vital field in industry, just as well-defined and as helpful to the industry as the trade association. To co-operate with the trade journal, and not to publish a journal in opposition should be the aim of the trade association secretary.

"Particularly, I believe, is this true of the question of advertising. I doubt if the solicitation of advertising by an association publication is right or proper. In most cases it is too close to the use of the big stick against those dealing in supplies for the industry, and might easily be unfair competition with the trade journal which means so much to the business man.

"In the American Paper and Pulp Association care is exercised to maintain most harmonious relations with the trade journals. They are provided with all of the material published in the association bulletin to its members, either simultaneously or in advance of its publication by the association publication. The bulletin of the association acts as an auxiliary to the trade journal to take merely official announcements of the industry to its members."

Bermingham & Prosser Company, Chicago and Kalamazoo, Mich., has just issued a handsome little booklet entitled "How Paper Is Made." This is particularly adapted for the larger users of paper, but is well worth perusal by those who know how paper is made.

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Stickle Compound
Condensing System
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As shown in the folder we sent out to the mills—"*How to Dry Paper*"—showing our Compound Condensing System for draining the dryers and heating the air with the discharge from the dryers to condition the machine room should interest you. We guarantee a saving of 20 per cent in steam consumed for this purpose.

Open Coil Heater &
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PAPER MILLS FOR SALE

In the East

Manila, fibre, colored textile, kraft and colored specialties mill. Two Fourdrinier machines trimming 68 inches. Twenty-five tons, 24 hours. Also pulp mill, grinders, digesters and wet machines. Ground wood 12 tons, sulphite fibre 7 tons, 24 hours. 600 horse water power, purest water, also steam and electricity. Mill on two railroads with private sidings.

Crepe towel and toilet mill. Fourdrinier machine trimming 58 inches. 7 tons 24 hours. 300 horse water power. On main line railroad. Excellent location.

Chip, news, manila lined and container board specialties mill. Two six-cylinder machines trimming 86 and 94 inches. 100 tons 24 hours. Water and steam.

We offer the finest developed water power left in New England, 400 horse water power. Fifteen acres of land, eighteen buildings, storehouses and dwellings. On main line Boston and Maine railroad. All there but the paper mill. Will sell at sacrifice for quick turnover.

We offer used Fourdrinier paper machine trimming 72 inches. Complete and in good condition. Immediate delivery and reasonable price.

In the West

Container, liner and combination box board mill. Two 5-cylinder machines. Trimming 70 and 84 inches. 45 tons 24 hours. On two large railroads with private sidings. 650 horse water power, steam and electricity.

Straw Kraft, Butchers Fibre, sulphite wrapper and car linings mill. Fourdrinier machine trimming 61 inches. 12 tons 24 hours. Steam. Railroad sidings.

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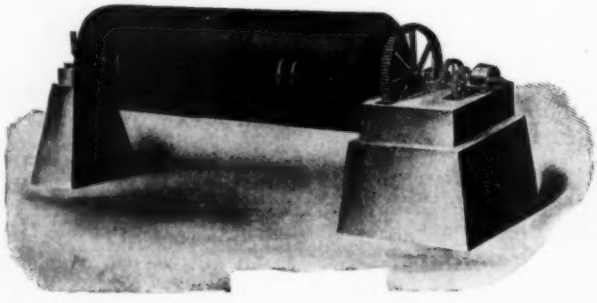

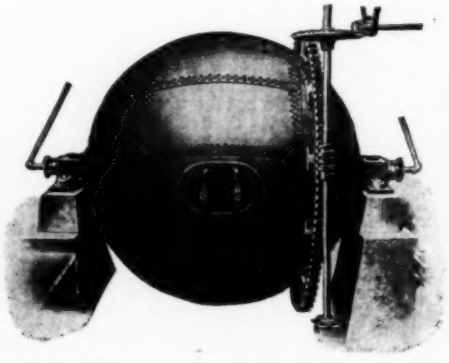

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